LFG meets diachronic typology: How reciprocal meaning migrates under morphological attrition in Austronesian languages of Indonesia

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Abstract

This paper develops a formal diachronic typology of reciprocal constructions in the Austronesian languages of Indonesia. It combines the documented Old-to-Modern Javanese trajectory with fieldwork data from Sigulai, Devayan, Sipora Mentawai, Mandailing and Kodhi, with additional evidence from Nias, Balinese and Indonesian. We argue that reciprocity is a constructional bundle: participant plurality, Actor/Undergoer role fusion (individual- or set-level), role permutation, object suppression and, for directed predicates only, subevent plurality. These components can persist while their exponents change. Modelling reciprocal formation in Lexical-Functional Grammar with Generalised Paradigm Function Morphology, we locate change in correspondences, specifically in which forms realise which features and in lexemic identity. The f-structure output and the core semantics remain stable. Role fusion is analysed as a many-to-one correspondence between distinct semantic roles and one grammatical function. Kodhi shows that a single exponent can supply the whole bundle, and that its reciprocal and antipassive uses differ only in fusion.

1 Introduction

Reciprocal constructions present a classic mapping problem.[†] An asymmetric bivalent predicate is used to describe a symmetric situation, and two semantic roles are borne by members of one participant set that is typically realised by a single grammatical function (Nordlinger 2023: 73). Languages solve this problem in different ways. Some retain two syntactic arguments, some derive a monovalent predicate, and some show mixed valency effects (Evans 2008; Nordlinger 2023: 78–81). Reciprocity is therefore a central testing ground for theories of valency, voice and the syntax–semantics interface (Dalrymple et al. 1998; Kemmer 1993; Nedjalkov 2007; Siloni 2012).

Austronesian languages of Indonesia are revealing because these mapping solutions interact with historically layered voice, middle and valency morphology. Reflexes of *pa(R)-, *si-, *-an[1], reduplication and Actor and Undergoer Voice recur in reciprocal, reflexive, sociative, causative and pluractional constructions (Kitada 2021; Arka et al. 2026).[2] No single exponent carries an invariant reciprocal meaning. Instead,

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[1] The *-an* suffixes of the modern languages may continue either of two Proto-Austronesian voice suffixes, locative voice *-an or patient voice *-ən (Ross 1995; Kaufman 2009, 2018; Blust 2013). We use *-an as a cover label.

[2] For readers unfamiliar with Austronesian voice: in the 'symmetrical voice' systems of western Austronesian, verbal morphology signals which core argument is the subject. Actor Voice (AV) selects the Actor and Undergoer Voice (UV) the Undergoer, without demoting the other argument to an oblique as a passive does (Himmelmann 2002; Arka & Manning 2008). *Pluractional* morphology marks plurality of events, for example repeated or distributed action.

the components of reciprocity are distributed across partly overlapping morphological resources, and they are reconfigured as inherited voice systems erode (Himmelmann 2002; Ross 2002; Arka 2009).

We address two questions. First, which parts of the reciprocal solution are contributed by root semantics, valency morphology, voice, event-number morphology and constructional structure? Second, how can a formal theory like LFG represent change when the reciprocal configuration persists but its morphological locus changes? Our answer is that **morphological attrition is not necessarily semantic attrition**. A language may lose a productive exponent while preserving the constructional output once associated with it, or retain an exponent after its earlier function has gone. We call the resulting reallocation *meaning migration*.

The paper makes three further claims. First, diachronic change in reciprocal constructions is located in correspondences, specifically in exponence and lexemic identity, while f-structure linking remains stable (§4, §5.3). Second, participant plurality must be separated from event plurality: every reciprocal requires a plural participant set, but only directed predicates require plural subevents, so a single holistic event such as an embrace needs no pluractionality (§3.2). Third, role fusion is a many-to-one correspondence across structures rather than an operation within one level (§3.3). Data from Kodhi (Sumba), where one prefix covers causative, reciprocal and antipassive functions, support all three claims (§6.2).[3]

2 Data and inferential method

The study combines two kinds of evidence with different inferential status (Table 1). Javanese has a long written tradition and permits claims about attested change. Qomariana's (2026) corpus spans Old (700–1299 CE), Middle (1300–1699), Early Modern (1700–1899) and Modern Javanese (1900–present), and draws on legacy texts and the Old Javanese–English Dictionary (Zoetmulder & Robson 1982). The other languages are documented synchronically, through natural texts, targeted elicitation and the reciprocal stimulus clips of Evans et al. (2004). The clips hold the event type constant while varying participant number, symmetry, simultaneity and repetition.

A methodological question arises: why should differences between languages documented at the same time be read as change?[4] We do not read them as stages of a single history. Synchronic distributions do not by themselves reveal the processes that produced them in each language (Cristofaro 2019: 26). Our diachronic claims rest on three narrower inferences. First, Javanese provides real-time evidence: the Old Javanese and Modern Javanese systems are attested stages of one language. Second, where daughter languages share cognate material, such as *pa(R)- or *si-, their different functions are outcomes of change from a common source; this is the logic of

[3] Abbreviations: 3 third person; ABS absolutive; ACC accusative; AN suffix *-an*; APASS antipassive; APPL applicative; ART article; AV Actor Voice; CAUS causative; CNJ conjunction; DEM demonstrative; DIST distal; LOC locative; MID middle; MUT mutation (Nias); NOM nominative; PFV perfective; PL plural; PN proper name; RECIP reciprocal; REFL reflexive; REL relative; SG singular; SI prefix *si-*; TR transitive; UV Undergoer Voice.

[4] We thank K. P. Mohanan for pressing us on this methodological point.

the comparative method, not of apparent time (Ross 2002; Kaufman 2018; Kitada 2021). Third, recurrence of the same correspondence pattern in independent branches is evidence for a recurrent pathway, not a proof of any particular history. Throughout, the strongest claims concern the Javanese record and the formal representation of reallocation.

Table 1: Languages and status of evidence (see Appendix 1 for the partial family grouping)

Language	**Austronesian Subgroup/area**	**Main source**	**Status of evidence**
Old/Modern Javanese	Javanese	Qomariana 2026; Erawati 2014	Documented diachrony
Sigulai	Central Barrier Islands	Akoli & Arka fieldwork	Synchronic comparison
Devayan (Simeulue)	Northern Barrier Islands	Mullan & Arka fieldwork	Synchronic comparison
Sipora Mentawai	Mentawai	Keith & Tatubeket in prep.	Synchronic comparison
Mandailing	Southern Batak	Li fieldwork	Synchronic comparison
Kodhi	Sumba, Sumba-Flores	Ghanggo Ate in prep.	Voice-attrition case
Nias	Central Barrier Islands	Brown 2001, Arka fieldwork	Synchronic comparison
Indonesian	Malayic	Arka & Manning 2008	Synchronic comparison
Balinese	Bali-Sumbawa-Sasak	Arka 2003; Arka & Dalrymple 2021	Synchronic comparison

Two further cautions apply. A lexically symmetric predicate such as ‘meet’ is not decisive evidence for productive reciprocal morphology. We therefore rely on directed roots such as ‘hit’, ‘kick’, ‘shoot’ and ‘teach’. Further, cognacy does not guarantee retention of function: Sipora Mentawai *masi-* contains material comparable to *si- but forms non-reciprocal transitives (§6.1).

3 Reciprocity as a constructional bundle

3.1 Reciprocal meaning versus reciprocal construction

Following Nordlinger (2023: 73–74), we distinguish reciprocity as a semantic concept from a reciprocal construction, a language-specific form conventionalised for mutual situations. The mapping is rarely one-to-one. Reciprocal meaning can arise from lexical semantics, valency affixes, reduplication or analytic operators such as Indonesian *saling*. Conversely, constructions labelled reciprocal are often polysemous, with reflexive, sociative, collective, antipassive or pluractional uses (Nedjalkov 2007; Haspelmath 2007). In Kemmer’s (1993: 98) terms, each participant in both reflexives and reciprocals is both Initiator and Endpoint; both lie between one- and two-participant events on her scale of participant distinguishability (p. 73).

3.2 Participant plurality versus event plurality

If reciprocity combines role fusion with pluractionality, is event plurality necessary in every reciprocal, given that an embrace is one event?[5] It is not, because two kinds of plurality must be kept apart. **Participant plurality** is required in every reciprocal: there must be at least two participants. **Event plurality** is required only when the predicate is directed. A directed predicate such as 'hit' does not entail its converse, so a reciprocal reading needs at least two oppositely directed relation tokens. A symmetric predicate such as 'meet', or a co-participatory one such as 'embrace', already entails mutual involvement in a single event. Siloni (2012) shows that lexical reciprocals necessarily denote symmetric events, and that their symmetry may be simultaneous. The semantics in (1) makes subevent plurality conditional on the root profile.[6]

(1) Reciprocal semantics
RECIP(X, E):
$|X| \geq 2$ (participant plurality: PART-NUM = PL)
for each $e \in E$: A(e), U(e) $\in X$, A(e) $\neq$ U(e)
A-SET(E) = U-SET(E) = X (set-level role fusion; ROLE-PERMUTATION = +)
$|E| \geq 2$ iff REL-TYPE = DIRECTED (SUBEVENT-NUM = PL)
$|E| \geq 1$ if REL-TYPE $\in$ {SYMMETRIC, COPARTICIPATORY} (one holistic event suffices)

The macro-event operator RECIP(X, E) captures the joint-event overlay of prototypical reciprocals: the participants are construed as acting together, not as figuring in two independent converse clauses (Evans 2010; Nordlinger 2023: 74). Strong, weak, pairwise and chained readings remain possible for larger groups (Dalrymple et al. 1998; Nordlinger 2023: 87–88). We further distinguish the subevent number of a macro-event from the plurality grade (PLURAL-GRADE) of the construction. One fight can contain many punches, and some constructions require 'big' or augmented (AUG), non-minimal plurality (§6.3). Such AUG readings are found in asymmetric reduplicative constructions, as in Javanese (§5.3).

3.3 Role fusion as a cross-level correspondence

Role fusion is sometimes treated as a single feature with values such as NONE, INDIVIDUAL and SET. We analyse it instead as two features at one level that map onto a single feature at another level, rather than as fusion within one level.[7] This is in the spirit of multidimensional approaches to argument structure (Mohanan 1994). At semantic structure, each directed subevent retains two distinct roles. At argument structure, the predicate retains two arguments. Fusion is the fact that both arguments correspond to one grammatical function. The type of fusion is then determined by the semantic relation between the role bearers, as in (2).

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[5] We thank an audience member at LFG'26 for raising this question with the example of 'embrace'.
[6] The representations use elementary set notation: $|X|$ is the cardinality (number of members) of the set X, $\in$ denotes set membership, and A-SET(E) is the set of individuals that act as Actor in some subevent of E; see Partee et al. (1990: 3–51) for an introduction to set theory.
[7] We thank K. P. Mohanan for suggesting this formulation.

(2) Fusion types as correspondences (ARG1, ARG2 = a-structure arguments; ↦ = mapping to f-structure)

a. NONE: ARG1 ↦ SUBJ, ARG2 ↦ OBJ

b. INDIVIDUAL: ARG1, ARG2 ↦ SUBJ;
A(e) = U(e) for each e (reflexive)

c. SET: ARG1, ARG2 ↦ SUBJ$_X$;
A-SET(E) = U-SET(E) = X, A(e) ≠ U(e) (reciprocal)

d. UNLINKED U: ARG1 ↦ SUBJ; ARG2 not linked,
existentially bound[8] (antipassive; §6.2)

This formulation has two advantages. First, the mismatch reviewed by Nordlinger (2023: 78–81), in which a reciprocal looks monovalent yet retains traces of a bivalent relation, follows directly: the bivalent relation persists at semantic structure and argument structure, while the f-structure has one SUBJ. Second, the correspondence need not be restricted to Actor and Undergoer. Kodhi shows that the set-level correspondence can hold between an Actor and a beneficiary[9] while an individual-level correspondence holds between the Actor and a possessor in the same clause (§6.2). Fusion is thus a family of correspondences, not a single operation.

3.4 Root profiles and middle semantics

Reciprocal formation interacts with the relational structure of roots. We distinguish SYMMETRIC roots (e.g., 'meet'), which entail the converse relation; COPARTICIPATORY roots (e.g., 'fight', 'embrace'), which conventionally require joint involvement; and DIRECTED roots (e.g., 'hit', 'kick', 'shoot', 'teach'), which do not entail the converse. With directed roots, the construction must impose set-level fusion and role permutation (2c). With symmetric roots, much of the mutuality is lexically licensed.

Reciprocal constructions belong to the wider middle domain, characterised by low elaboration of events and low distinguishability of participants (Kemmer 1993: 73, 243–247). Arka et al. (2026) distinguish two kinds of causative morphology. CAUSE_fused permits the initiating and affected participants to overlap; CAUSE_disjoint requires a causer distinct from the affected participant. Only the fused type is compatible with reciprocal-middle role fusion. This explains why reflexes of *pa- recur in both causative and reciprocal functions in Enggano, Kodhi, Nias and Sipora Mentawai, and why disjoint causatives such as Indonesian *-kan* resist reciprocal extension.

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[8] By "existentially bound" we mean that the Undergoer remains part of the predicate's meaning but is not linked to any grammatical function. Instead, it is closed off by an existential quantifier: for Kodhi *na=ha-palu* (12c), roughly ∃y[hit′(x, y)], 'there is someone or something that x hit'. The verb thus stays semantically transitive, since a hitting event still entails something hit, but the patient is unspecified and cannot be referred to. This is why no object clitic is possible (12d), and why the construction focuses on the Actor's activity ('did some hitting'). It is the semantic profile of antipassives in which the logical object is suppressed: the predicate remains semantically transitive but projects no direct object (Polinsky 2017: 310), and parallels the indefinite reading of unspecified objects, as in English *She ate* (Fillmore 1986; cf. also Polinsky 2017: 329–330). The other cases in (2) differ in how the Undergoer is resolved. In the reflexive and reciprocal (2b–c), it is identified with the subject (individually or as a set), and in the transitive (2a) it is linked to OBJ.

[9] We capitalise the macroroles Actor and Undergoer (Van Valin 2005) but not specific thematic roles such as beneficiary, possessor and theme.

4 The architecture: where change is located

4.1 Structures and correspondences

Where exactly does diachronic change take place: in grammatical relations, in f-structure or in semantics?[10] To answer this we must first say what each structure contributes. We assume the standard LFG projection architecture (Bresnan et al. 2016; Dalrymple et al. 2019, among others) with four relevant levels.[11] C-structure hosts the morphologically complex words delivered by the morphology.[12] Argument structure records the arguments of the derived lexeme. F-structure records grammatical functions. The semantic level records the grammatically relevant event structure of the lexeme: roles, root profile, subevent number and plurality grade.

This semantic level is best described as grammatical semantics: it encodes the features that matter for grammar. Our semantic representations are RRG-style logical structures (Van Valin 2005)[13] of the kind that determine argument realisation; they do not provide truth conditions. A compositional treatment, for example in Glue Semantics, is compatible with the analysis, and valency-related meanings can be stated in that format (Asudeh & Giorgolo 2012; Findlay 2016). We use the more abstract representation because the diachronic claims concern which grammatically relevant features are exponed, not truth-conditional content.

On this architecture, a construction is a set of correspondences: between exponents and features, between semantic roles and arguments, and between arguments and grammatical functions. Diachronic change can target any of these correspondences (Vincent 2001; Booth & Butt 2023). Our claim for reciprocals is specific: the changes documented in this paper affect the exponent correspondence and lexemic identity, whereas the mapping from the fused argument set to SUBJ and the core of the semantics are stable (§5.3).

4.2 Generalised paradigm functions

We model reciprocal formation with Spencer's (2010, 2013) Generalised Paradigm Function Morphology (GPFM). A generalised paradigm function (GPF) maps a lexeme and a feature bundle to a related lexeme through four component functions, as in (3).

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[10] We thank Steve Wechsler for asking where exactly the change is located.

[11] For readers new to LFG: c(onstituent)-structure represents phrase structure and word order, a(rgument)-structure the arguments a predicate selects, and f(unctional)-structure the grammatical functions such as SUBJ and OBJ. The levels are related by correspondence (mapping) functions rather than derived from one another (Bresnan et al. 2016; Dalrymple et al. 2019).

[12] Nothing in the analysis depends on m(orphological)-structure as an independent projection. Morphological exponence is handled by the paradigm function, whose output feeds c-structure terminals, as in realisational approaches to the LFG–morphology interface (Sadler & Spencer 2001; Dalrymple 2015). We thank K. P. Mohanan for the discussion of this point and of the status of the semantic level.

[13] In this notation, primed predicates (e.g., do′, shoot.arrow′) are semantic constants, and do′(*x*, …) marks an activity whose Actor is *x* (Van Valin 2005).

(3) GPF architecture
GPF($\langle L, \sigma \rangle$) = $\langle L', \sigma' \rangle$, with
*f*FORM: morphophonological form (exponence)
*f*SYN: argument structure and its mapping to grammatical functions
*f*SEM: logical structure and event-structure features
*f*LI: lexemic identity, i.e., the type of lexeme derived

The decomposition makes the locus of change explicit. A language may preserve *f*SYN and *f*SEM while changing *f*FORM; it may preserve part of *f*FORM while changing *f*SEM and *f*LI; or it may retain a lexeme-building slot after losing the voice morphology that once surrounded it. Following Arka et al. (2026), reciprocal-middle morphology is lexeme-building: it changes semantic organisation and lexemic identity. Voice morphology is argument-linking: it maps the arguments of an existing lexeme to grammatical functions. The order of application is therefore fixed: the reciprocal-middle GPF applies to the root, and voice applies to its output.

5 Javanese: documented re-exponence

5.1 Old Javanese

Old Javanese had a rich voice inventory. Erawati (2014) identifies agentive morphology (*ma-*, *a-*, nasal prefixes and <*um*>), passive morphology (<*in*>, *ka-*, *-en*) and a set of morphological middles whose single subject has both agent-like and patient-like properties. The prefix *ma-*/*a-* was polyfunctional, so middle status follows from the argument organisation of a given root–construction combination, not from the prefix alone.

With symmetric and co-participatory roots, *ma-* packages a dyadic relation as a one-place predicate: *ma-temu* 'meet', *ma-pagut* 'clash', *ma-prang* 'fight' and *ma-gelut* 'wrestle' (Qomariana 2026), as in (4). No sequence of reversed subevents is required.

(4) Old Javanese
... *ma-temu* *ing* *tengah* *lwir* *guntur* *ma-pagut*
MID-meet LOC middle like thunder MID-clash
'[The gods and the demons] met in the middle, like clashing thunder.'
(Qomariana 2026, AW 25.4)

With directed roots the situation is different. *Ma-mukul-an* 'hit each other', *ma-kacacah-an* 'slash each other' and *ma-manah-an* 'shoot arrows at each other' cannot obtain their reciprocal reading from lexical symmetry. The construction must map one plural subject set to both Actor and Undergoer across the subevents, and *-an* supplies the articulated event domain[14] needed for the alternation, as in (5).

[14] By *event domain* we mean the macro-event over which the reciprocal relation holds: the set E in RECIP(X, E) in (1), which groups the participants' interactions into a single reciprocal event. An event domain is not the same as event plurality. It may contain a single holistic event, as with co-participatory *rangkul-an* 'hug each other' (7), or several oppositely directed subevents, as directed roots require ($|E| \geq 2$). In Modern Javanese, *-an* licenses the reciprocal and supplies the domain, while reduplication supplies its plurality: hence reciprocal *panah-panah-an* 'shoot at one another' but not *panah-an*. In Old Javanese, *ma-…-an* could supply a plural domain on its own (*ma-manah-an*); reduplication was optional and added

(5) GPF for Old Javanese *ma-manah-an* ‘shoot arrows at each other’
*f*FORM: *manah* → *ma-manah-an*
*f*SYN: ⟨ARG1, ARG2⟩, ARG1 ↦ SUBJ, ARG2 ↦ OBJ
→ ⟨ARG1, ARG2⟩, ARG1, ARG2 ↦ SUBJ$_X$
*f*SEM: RECIP(X, E)[Σe∈E do′(A(e), shoot.arrow′(A(e), U(e)))]; FUSION = SET;
REL-TYPE = DIRECTED; SUBEVENT-NUM = PL
*f*LI: MANAH → RECIP-MID(MANAH)

Old Javanese also had asymmetric reduplicative reciprocals containing an Undergoer Voice (UV) copy, such as *tulung-t<in>ulung* ‘help one another’ and *pupuh-p<in>upuh* ‘strike one another’ (6). The internal voice contrast iconically evokes the alternation between striking and being struck. Crucially, the construction as a whole is not passive: its single plural subject comprises members who are Actors in some subevents and Undergoers in others.

(6) Old Javanese
silih *wor,* *a-pupuh* *p<in>upuh* *ring* *gada*
each.other mix MID-strike <UV>strike with club
‘They struck one another with clubs.’ (Qomariana 2026, AR XIII.23.03)

5.2 Modern Javanese

Modern Javanese has lost productive reciprocal *ma-* and does not use *<in>* as an ordinary voice exponent (Qomariana 2026). Reciprocal work is concentrated in *-an* and reduplication (7). For directed roots, the verb with reduplication *panah-panah-an* is required for ‘shoot at one another’; bare *panah-an* lacks the reciprocal verbal reading. *Tulung-tulung-an* is the productive counterpart of older *tulung-t<in>ulung*.

(7) Modern Javanese
wong *loro* *rangkul-an*
person two hug-AN
‘The two people hugged each other.’ (Qomariana 2026, VR.07)

5.3 What changed and what did not

If the reciprocal semantics did not change, what did?[15] Table 2 answers this level by level. The answer has two parts. At the level of the construction, the output is stable: in both periods, the plural participant set is linked to a single SUBJ, and set-level fusion and role permutation hold. At the level of individual morphemes, almost everything changed. *Ma-* and *<in>* ceased to be productive reciprocal resources, and *-an* and reduplication took over their load. This is why we speak of reciprocal constructions rather than reciprocal markers.

augmentation, as in *a-pana-panah-an* ‘fight a battle shooting arrows at one another’ (Zoetmulder & Robson 2011: 742).

[15] We thank Gillian Ramchand, Piyapath T. Spencer, Björn Lundquist and Miriam Butt for asking what changes if the semantics does not.

Table 2: Locus of change in Javanese directed-root reciprocals

Level	Old Javanese	Modern Javanese	Change
Exponence (*f*FORM)	(*m*)*a*-V-*an*; V-UVFORM(V)	V-*an*; REDUP-V-*an*	changed
Lexemic identity (*f*LI)	RECIP-MID(V); RECIP-AUG-UVCOPY(V)	RECIP-AN(V); RECIP-AUG-REDUP-AN(V)	changed
Contribution of *-an*	event domain, plural with directed roots (with *ma-*)	reciprocal licensing; event domain, not plural by itself	changed
Contribution of REDUP	optional augmentation (*a-pana-panah-an*)	subevent plurality (obligatory with directed roots); augmentation	changed
Root coverage	*ma-* with symmetric roots	lexicalisation; gaps such as **panah-an*	changed
Argument linking (*f*SYN)	ARG1, ARG2 ↦ $SUBJ_X$	ARG1, ARG2 ↦ $SUBJ_X$	stable
Core semantics (*f*SEM)	set fusion; role permutation	set fusion; role permutation	stable

The semantics therefore did not stay entirely constant. The core reciprocal relation is stable, but the semantic contribution of individual exponents has been reallocated: *-an* now licenses the reciprocal on its own, while subevent plurality for directed roots has moved to reduplication. The change is best stated as a change in the correspondence between a stable constructional output and its realisation (8). We do not claim that a feature moves from one morpheme to another in one step. Learners acquire a new construction whose output overlaps with that of the older one, while its exponence and internal analysis differ; re-exponence is the diachronic relation between the two.

(8) Old-to-Modern Javanese correspondence (augmented reciprocity)
Old Javanese: *f*FORM: L → L-UVFORM(L); *f*LI: RECIP-AUG-UVCOPY(L)
Modern Javanese: *f*FORM: L → REDUP(L)-*an*; *f*LI: RECIP-AUG-REDUP-AN(L)
Stable: *f*SYN: ARG1, ARG2 ↦ $SUBJ_X$; *f*SEM: FUSION = SET; ROLE-PERMUTATION = +; PLURAL-GRADE = AUGMENTED

6 Comparative microvariation

The comparative data fall into three recurrent patterns. These patterns identify where components of the reciprocal bundle are exponed; they are not historical stages, and a single language may combine them. In Pattern A, reflexes of *pa(R)- absorb reciprocal-middle function into valency morphology (§6.1–6.2). In Pattern B, reflexes of *si-, often within *maR-si-, add mutual affectedness, participant plurality, distributivity or sequential interaction (§6.3–6.4). In Pattern C, *-an* and reduplication carry event-structural components, especially subevent plurality and augmentation, as in Modern Javanese (§5.2) and Indonesian (§6.5).

6.1 Pattern A: reciprocal-middle absorption into valency morphology

Reflexes of the *pa(R)- complex derive a one-place reciprocal-middle predicate from a dyadic root, and the same form also serves as a causative (Arka et al. 2026). Nias *fa-*

illustrates the syncretism (9).[16] In Sipora Mentawai, the reciprocal-middle is *pa-lakkai* ‘hug each other’, whereas transitive ‘hug’ requires *masi-lakkai-ake’* (10). Sipora Mentawai thus shows formal retention without functional retention: apparent *si- material survives inside a transitive template, while the reciprocal function is carried by *pa-*.

(9) Nias

a. *fa-bözi* *ira*
RECIP-hit 3PL.MUT
‘They hit each other/one another.’ (Brown 2001: 563)

b. *la-fa-sindro* *gehomo*
3PL-CAUS-stand pillar
‘They erected the pillar.’ (Brown 2001: 233, 235)

(10) Sipora Mentawai

a. *si=manteu* *nera* *masi-lakkai-ake’* *si=nanalep*
REL=male DEM.DIST AV.TR-hug-APPL REL=female
‘That man hugs the woman.’ [elicited]

b. *rua* *si=nanalep* *pa-lakkai* *sia*
two REL=female RECIP.MID-hug 3PL
‘The two women hug each other.’ [elicited]

Root semantics and the feature bundle determine whether *pa-*/*fa-* builds a reciprocal-middle lexeme with set-level fusion or a causative lexeme with a distinct causer. Balinese shows a partial syncretism: *ma-gelut* is an ordinary reciprocal ‘hug each other’, while *pa-gelut* adds collective or simultaneous plurality, and *pa-* also has causative and pluractional uses (Arka 2003; Arka & Dalrymple 2021; Arka et al. 2026).

6.2 Pattern A after voice loss: reciprocity, antipassive and reflexive in Kodhi

Kodhi (Sumba, eastern Indonesia) adds a case in which the inherited voice system has disappeared, as in other languages of the Sumba–Flores group (Arka 2009; Arka & Wouk 2014). Arguments are indexed by pronominal clitics: NOM proclitics for S and A, and ACC or DAT enclitics for P.[17] There is no productive AV/UV alternation, but the prefix *pa-*/*ha-* persists with causative, reciprocal and other middle functions (Ghanggo Ate in prep.; Ghanggo Ate & Arka 2026; Arka et al. 2026). With a symmetric root, the reciprocal blocks the object clitic and requires a plural subject (11). The same holds for the co-participatory ‘nose-kiss’ in (11c), with a conjoined subject.

[16] Following Arka et al. (2026), we take Nias *fa-* and Sipora Mentawai *pa-* to be reflexes of the same *pa(R)- complex. Note that the Sipora Mentawai reciprocal is formed on the bare root, whereas the transitive requires the *masi-…-ake’* template.

[17] The Kodhi data come from Ghanggo Ate’s fieldwork corpus (codes in square brackets refer to texts and elicitation sessions; Ghanggo Ate in prep.). The prefix *pa-* surfaces as *ha-* before disyllabic bilabial-initial bases, hence *ha-palu* ‘hit each other’. The antipassive judgements in (12) are elicited.

(11) Kodhi

a. *a=tobhoko=ya*
3PL.NOM=meet=3SG.ACC
'They met him.' [fieldnotes]

b. *a=pa-tobhoko*
3PL.NOM=RECIP-meet
'They meet each other.' [KOD16]

c. *Njomi monno Robhu a=pa-udhoko*
PN CNJ PN 3PL.NOM=RECIP-nose.kiss
'Njomi and Robhu nose-kiss each other.' [elicited]

Kodhi is especially informative with directed roots, for three reasons.

First, Kodhi *pa-* forms reciprocals from directed roots such as *palu* 'hit', *icce* 'see' and *ndakuro* 'stab' (12–13) without any additional event-structure morphology. Indonesian requires *-an* (*ber-pukul-an*, **ber-pukul*) and Modern Javanese requires reduplication with *-an*. The root-profile generalisation of §3.4 is therefore a constraint on features, not on morphemes: a directed-root reciprocal requires an exponent that supplies set fusion and role permutation, and in Kodhi a single prefix does so. This is precisely the kind of variation expected if change targets the exponent correspondence while the feature bundle is constant.

(12) Kodhi

a. *a=palu=ya*
3PL.NOM=hit=3SG.ACC
'They hit him.' [KOD104]

b. *a=ha-palu*
3PL.NOM=RECIP/APASS-hit
(i) 'They hit each other.' (ii) 'They hit (someone)/did some hitting.'
[elicited]

c. *na=ha-palu*
3SG.NOM=APASS-hit
'S/he hit (someone)/did some hitting.' [elicited]

d. **na=ha-palu=ya*
3SG.NOM=APASS-hit=3SG.ACC
Intended: 'S/he hit him.' [elicited]

Second, the same form *ha-palu* has a reciprocal and an antipassive use (12). With a plural subject, both readings are available (12b); with a singular subject only the antipassive is possible (12c), and the object clitic is excluded (12d). In terms of (2), the two uses share the same *f*FORM and *f*SYN output (a single SUBJ) but differ in fusion: SET in the reciprocal, UNLINKED U in the antipassive. Object suppression is thus an independent component of the reciprocal bundle. It can occur without fusion, and only fusion brings the plural-subject requirement. The pairing fits Sansò's (2017) finding that reflexive and reciprocal markers are a recurrent source of antipassives. A plausible pathway is loss of role permutation, giving a holistic plural activity reading ('they did some hitting'), followed by loss of the plurality requirement. Preliminary lexical data point the same way: in Ghanggo Ate's (in prep.) tested set of eleven bases, every base that allows the antipassive also allows the reciprocal, but not vice versa.

(13) Kodhi

a. *a=icce* *wudha=ka* (individual-level fusion)
3PL.NOM=see REFL.3PL=PFV
'They saw themselves.' [elicited]

b. *a=pa-icce=ka* (set-level fusion)
3PL.NOM=RECIP-see=PFV
'They saw each other.' [elicited]

c. *a=pa-ndakuro* *wudha* *wawi* (combined-level fusion)
3PL.NOM=RECIP-stab REFL.3PL pig
'They each stabbed their own pigs for each other.' [elicited]

Third, Kodhi separates the two fusion types across exponents (13). Individual-level fusion is analytic, expressed by the reflexive *wudha* (13a); set-level fusion is expressed by *pa-* (13b). The two can combine (13c). Here *pa-* establishes set-level fusion between the Actors and the beneficiaries ('for each other'), while *wudha* identifies each Actor with the possessor of the theme ('their own pigs'), and the theme *wawi* 'pig' is retained. This is direct evidence that fusion is not one operation at one level: two distinct correspondences—of different types and involving different roles—hold in one clause. It also shows that reciprocal *pa-* does not always suppress every object. Like Mandailing *marsi-poda-an* (§6.4), it can leave a theme in place.

6.3 Pattern B: holistic, basic and augmented reciprocity in Sigulai and Devayan

Pattern B involves *si- in *maR-si- and related complexes. Kitada (2021) shows that *si- formations express reciprocal, actor plural, reflexive and comitative-actor meanings, among others, and cannot be reduced to a dedicated reciprocal morpheme. Sigulai contrasts a general reciprocal-middle *be*-V with an enriched *be-si*-V (14). Both occur in mutually involving situations, but the *si-* form profiles a sequential or distributed interaction.

(14) Sigulai

dalua *yalaffe* *affainga* *ana* *ila* *bė-bukha* *akhuli*
two woman recent just 3PL.ABS MID-meet immediate
ila *bė-si-sapo*
3PL.ABS MID-SI-greet
'The two women had just met, and they immediately greeted each other.'
(Akoli & Arka fieldwork)

Devayan preserves a productive three-way opposition among Actor Voice *maN*-V, reciprocal *maN-si*-V and passive *ni*-V (15). Co-participatory predicates instead take *be-*, as in *be-pale* 'hug each other'. Its punching paradigm separates three grades of reciprocity, which Indonesian matches with different means (Table 3).

(15) Devayan

Si *Wawan* *alek* *si* *Novin,* *eksiraya* *sia* *mansi-tenang.*
ART Wawan and ART Novin 3PL 3PL AV.SI-kick
'Wawan and Novin kicked each other.' (Mullan & Arka fieldwork)

Table 3: Holistic, basic and augmented reciprocity in Devayan and Indonesian

Grade	Devayan	Indonesian	Profile
Holistic	*be-tenju*	*ber-tinju*	a fight construed as a whole; magnitude unspecified
Basic	*mansi-tenju*	*saling tinju/meninju*; *ber-pukul-an*	$\|X\| \geq 2$, $\|E\| \geq 2$; ordinary role permutation
Augmented	*tenju-menenju*	*tinju-meninju*; *pukul-memukul*	non-minimal *X* and *E*; repeated pairings

All three grades link the participant set to a single SUBJ. Devayan *tenju-menenju* is inappropriate for a minimal exchange between two people, whereas the Indonesian reduplicatives favour, rather than require, extensive mutual activity. The holistic grade is relevant to the question of event plurality (§3.2): *be-tenju* and *ber-tinju* treat the fight as one event and do not quantify its punches.

6.4 Patterns B and C combined: resolving the level of fusion in Mandailing

Mandailing makes the reflexive–reciprocal relation transparent. With co-participatory *adu* 'compete, fight', *mar-adu* is the unmarked reciprocal-middle: it denotes joint competitive involvement, as in a race, with no restriction on the number of participants. *Marsi-adu* adds mutual impact: the participants act on, or are measured against, one another. The impact may be physical, as in a fight, but need not be. In (16), said of pupils competing in front of their teacher, each is measured against the others: our consultants render it with Indonesian reciprocal *saling* and superlative *paling* (*mereka saling beradu siapa yang duduk paling baik*), whereas the *mar-adu* counterpart is rendered without either (*mereka berebut siapa yang duduk baik*). *Marsi-adu* is understood as involving a group when the number of participants is not specified; for two participants speakers prefer *mar-adu*, though *marsi-adu* remains possible (Li fieldwork). With directed *poda* 'teach', *marsi-poda* is reflexive ('teach oneself'), while *marsi-poda-an* is reciprocal ('teach each other')[18], with an optional theme. How, then, does a speaker know whether *si-* is reflexive or pluractional?[19] We propose that *si-* requires fusion but does not specify its level, and that the level is resolved by the structure available, as summarised in (17).

(16) Mandailing

mar-si-adu	*denggan*	*alai*	*juguk*
MID-SI-compete	good	3PL	sit

'They (more than two) are competing with one another to sit well (i.e. over who can sit best).' (Li fieldwork; glosses after Batubara et al. 2026)[20]

[18] The pattern recurs in the lexicon. Batubara et al. (2026) list reciprocal *marsi-…-an* forms such as *marsijoloan* 'face each other' (beside *marjoloan*; p. 74), *marsiummaan* 'flirt with each other' (p. 66) and *marsitiopan tangan* 'be arm in arm' (p. 90).

[19] We thank Rachel Nordlinger for raising this question. Lexically specified exceptions, such as distributive *marsi-* forms without reciprocal or reflexive readings, remain to be analysed.

[20] We follow Batubara et al. (2026: 206) in writing *alai* for the third person plural pronoun; in Li's data it also occurs as *kalai*, *halai* and *halahi*, with *kalai* common after a consonant-final word.

(17) Resolution of *si-* in Mandailing
mar-: middle domain (single SUBJ); *si-*: FUSION ≠ NONE, level unspecified
a. directed root, no *-an*: no plural event domain → FUSION = INDIVIDUAL (reflexive *marsi-poda*)
b. directed root + *-an*: plural subevents available → FUSION = SET (reciprocal *marsi-poda-an*)
c. co-participatory root: *mar-* gives joint participation; *si-* adds set-level FUSION with ROLE-PERMUTATION (mutual impact, not necessarily physical), with a defeasible preference for an AUGMENTED plurality grade (*marsi-adu*)

The principle is that *si-* always contributes A/U fusion but specifies neither its level nor the event structure. With directed roots, *-an* resolves the level: individual without it, set with it, since set-level fusion needs the plural event domain that *-an* supplies (cf. (1)). With co-participatory roots, which entail joint involvement but not mutual affectedness, *si-* turns joint participation into mutual impact, raising the distinguishability of participants (Kemmer 1993: 73). Larger groups and intensified interaction are a defeasible correlate, as with the Indonesian reduplicatives in Table 3. Mandailing thus shows the gradience between basic and augmented reciprocity: *mar-adu* is the unmarked, basic member, and *marsi-adu* shades towards the augmented end. The contrast with Kodhi is instructive. Kodhi expones the two levels with distinct forms, *wudha* and *pa-*; Mandailing expones fusion once and lets event structure decide its level.[21]

6.5 Pattern C and analytic reciprocity in Indonesian

Indonesian lacks a productive *si-* reciprocal.[22] It uses the analytic operator *saling* for basic reciprocity and asymmetric reduplication with an AV copy for augmented reciprocity (Table 3). The optional AV morphology after *saling* is important: *saling pukul* and *saling memukul* have the same reciprocal linking. The AV form is visible in *f*FORM, but its ordinary Actor-to-SUBJ mapping (Arka & Manning 2008) is overridden by the higher reciprocal construction. The same holds for the AV copy in *pukul-memukul* and Devayan *tenju-menenju*, and for the UV copy in Old Javanese *tulung-t<in>ulung*: in all cases the complete plural set is the sole SUBJ. Voice morphology inside a reciprocal template is construction-internal and does not determine final linking. This gives an explicit correspondence-based implementation of the mixed-valency intuition discussed by Nordlinger (2023: 78–81).

[21] Old Javanese shows a comparable split: *amaksa* 'force oneself (to do something)' has a reflexive reading, while *a-pa-paksa-an* 'force their opinions on one another', with *-an*, is reciprocal (Zoetmulder & Robson 2011: 734–735). The *pa-* in *apapaksan* is CV-reduplication, a common strategy in Old Javanese (Qomariana 2026), so the reciprocal here combines reduplication and *-an* (Pattern C).

[22] Indonesian does retain *si-* in a small set of *ber-si-* verbs: *bersikeras* 'persist', *bersitegang* 'persevere', *bersikukuh* 'be stubborn, persist' and *bersijingkat* 'walk on tiptoes' (Sneddon et al. 2010: 69). Sneddon et al. treat *si-* here as optional. In the first author's native-speaker judgement, however, *si-* is typically present when plural participants in a speech event are implied. For example, *bersikeras* (alongside *berkeras*) can describe persistence in a strong stance in a debate, a context that implies reciprocity. Where no reciprocity is implied, only *berkeras* is possible, as in *jangan kamu berkeras kepada murid-muridmu* 'Don't be strict with your students' (KBBI 2016). This residual sensitivity of *si-* to implied plurality fits the plural-participation function of *si- (Kitada 2021).

7 A typology of attrition outcomes and predictions

The comparison yields a small set of outcomes, summarised in Table 4. They are not mutually exclusive stages: a single language can show several at once.

Table 4: Outcomes of attrition, stated as correspondence changes

Outcome	Formal description	Illustration
Exponent loss	an exponent ceases to be productive	Old Javanese <*in*> in Modern Javanese
Formal retention, functional loss	material survives without its earlier feature	Sipora Mentawai *masi-*/*pasi-*
Re-exponence	the same bundle is realised by new morphology	*tulung-t*<*in*>*ulung* → *tulung-tulung-an*
Analyticisation	an independent operator carries the relation	Indonesian *saling*; Kodhi *wudha*
Functional absorption	an inherited formative expands into the reciprocal domain	Sipora Mentawai *pa-lakkai*; Kodhi *pa-tobhoko*
Functional extension	a component of the bundle detaches and is exponed alone	Kodhi antipassive *ha-palu*
Constructional specialisation	basic and augmented grades split across strategies	*saling pukul* vs *pukul-memukul*

Three principles organise these changes:

- **Structural proximity**: adjacent exponents in the predicate complex, such as *pa(R)-, *si-, *-an, reduplication and voice morphology, are likely to fuse or be resegmented.
- **Feature affinity**: features are reassigned to hosts with overlapping semantics; *-an and reduplication, already associated with event number and distribution, are natural hosts for subevent plurality.
- **Economy of exponence**: material can be reduced when another host makes its contribution recoverable.

The analysis makes the following predictions, each stated over features and correspondences.

- **CAUSE_fused.** Where an inherited *pa*-type exponent permits an affected initiator or role fusion, causative–reciprocal–middle syncretism is likely; a strictly disjoint causative should resist reciprocal extension (Arka et al. 2026).
- **Root profile.** Directed roots require an exponent or construction that supplies set fusion, role permutation and subevent plurality; symmetric and co-participatory roots do not. Whether one morpheme (Kodhi *pa-*) or several (Javanese REDUP-V-*an*) supplies these is free to vary.
- **Event-plurality hosts.** When dedicated middle or reciprocal morphology erodes, event-structural components migrate first to semantically related hosts, especially *-an* and reduplication.
- **Voice copies.** AV or UV material inside a reciprocal template does not determine final linking; the fused set is linked to SUBJ whatever the orientation of the internal copy.
- **Detachment.** Components of the bundle can detach and be exponed alone. Object suppression without fusion yields an antipassive, as in Kodhi, so

reciprocal-to-antipassive extension may be favoured where the plurality requirement comes from the construction rather than from the exponent.

8 Conclusion

Reciprocal meaning in the Austronesian languages of Indonesia migrates under morphological attrition. The best-documented case is Javanese: Old Javanese had productive middle *ma-*/*a-*, *-an*, reduplication and an Undergoer Voice resource recruited into augmented reciprocal templates. Modern Javanese has lost productive reciprocal *ma-* and <*in*>, but set-level fusion, role permutation and event plurality persist through *-an*, REDUP-V-*an*, lexicalisation and analytic strategies. The comparative languages map out complementary outcomes, and Kodhi shows that a single prefix can carry the whole bundle after voice loss.

Three general results follow. Change is located in correspondences, namely exponence and lexemic identity, while f-structure linking and the core semantics are stable. Event plurality is required only for directed predicates; participant plurality is required for all. Role fusion is a family of many-to-one correspondences between distinct roles and one grammatical function, which can involve beneficiaries and possessors as well as Actors and Undergoers. These results address two gaps identified by Nordlinger (2023: 89): formally similar strategies can conceal different mechanisms, and the relation between reciprocal form and polysemy is poorly understood. Future work should test the holistic, basic and augmented contrast with controlled participant and event manipulations, extend the Kodhi reciprocal–antipassive tests to a larger set of bases, and compare the proposed principles with reciprocal and middle change outside Austronesian.

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Appendix 1: Genealogical position of the languages discussed

(adapted from Mbete 1990; Smith 2017; Lovestrand 2021; Billings & McDonnell 2024)

