

LFG meets diachronic typology in Indonesian Austronesian

How reciprocal meaning migrates under morphological attrition

From morpheme loss to feature reallocation across parallel structures

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The empirical and theoretical puzzle

- Reciprocals are semantically complex but often morphosyntactically compact:
 - Reciprocal events involve at least two participants and role permutation: A acts on B; B acts on A.
 - But many languages encode this within a single intransitive or middle-like clause.
- In Indonesian Austronesian, **inherited** morphology associated with **reciprocal**, **middle**, or **sociative** meaning is often **eroded**, **fused**, or **reanalysed**. **Yet reciprocal meanings persist.**
- **Where** does reciprocal meaning go when reciprocal morphology erodes?
- **How** is it theoretically possible (in LFG terms)?

Sipora Mentawai:

(1) *pa-lakkai* *sia*

MID-hug 3PL

‘They hug (each other).’

(2) *si-manteu* *nera*

SG.PERS-male DEM.DIST

masi-lakkai-ake’ *si-nanalep*

AV.TR-hug-APPL SG.PERS-female

‘That man hugs the woman.’

Our argument: A road map

- 1) Define **reciprocal meaning** vs **reciprocal construction**.
- 2) Show **three synchronic micro-patterns** across Indonesian Austronesian.
- 3) Interpret them as diachronic pathways of **meaning migration**.
- 4) Formalise the changes in LFG as shifts across:
 - m-structure / exponence
 - a-structure / role fusion
 - f-structure / grammatical features
 - sem-structure / reciprocal and event-plural meanings

Crucial distinction:

Reciprocal meaning vs Reciprocal construction

- **Definition:**

- **Reciprocal meaning ('reciprocity'):** A semantic configuration in which members of a plural participant set stand in mutually reversed relations.
- **Reciprocal construction:** A language-specific morphosyntactic strategy conventionally used to encode such meanings.

- **The mapping is not one-to-one:**

- Reciprocity may be expressed lexically, compositionally / constructionally, or by general valency morphology;
- Morphological exponents in the reciprocal construction may develop middle, collective, sociative, pluractional, or distributive readings

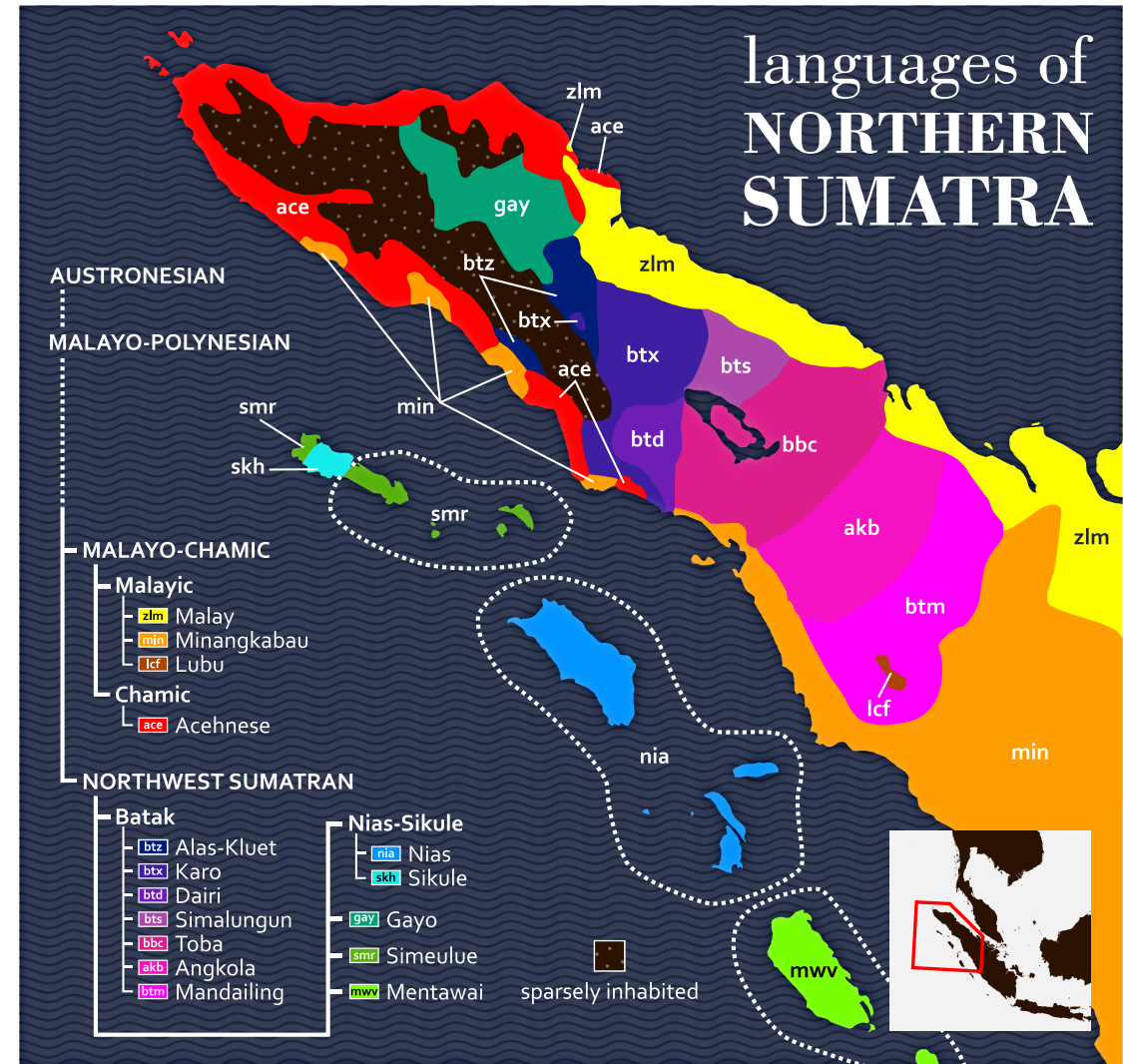
Lexically symmetric reciprocity vs constructional reciprocity

Type	Example type	Point
Lexically symmetric reciprocal predicate	‘meet’, ‘fight (e.g., in a war)’	reciprocally symmetric event may come from lexical semantics
Reciprocal construction	‘hit each other’, ‘hug each other’	reciprocity is constructionally encoded
Middle/sociative construction	‘meet with’, ‘gather’, ‘do together’	may imply reciprocity but not always

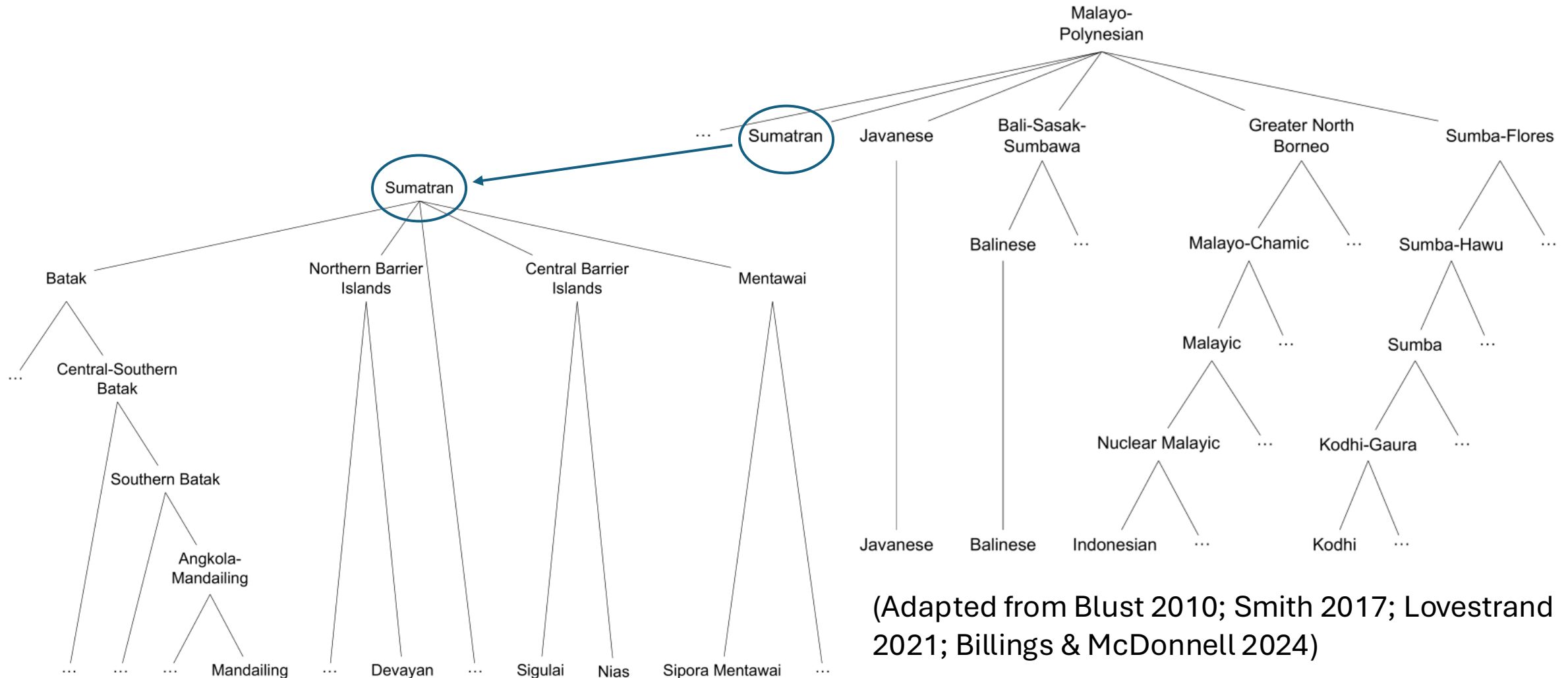
- Languages may have different roots and morphological resources for equivalent reciprocity; e.g. a root *temu* ‘to meet’ in Indonesian, which takes *ber-*, e.g., *ber-temu* ‘X MID-meet (with Y)’ (V.ITR), or APPL *-i*, e.g. *temu-i* ‘X meet Y’ (V.TR)

The data landscape: Indonesian Austronesian

- **Old vs. Modern Javanese diachrony:**
 - Documented reallocation
- **Typological-comparative variation from Indonesian Austronesian languages:**
 - **Barrier Islands/Sumatran**
 - Sigulai
 - Devayan/Simeulue
 - Nias
 - Sipora Mentawai
 - Mandailing Batak
 - **Other IND languages:**
 - Indonesian
 - Balinese
 - Kodhi



The data landscape: Indonesian Austronesian



(Adapted from Blust 2010; Smith 2017; Lovestrand 2021; Billings & McDonnell 2024)

Methodology

- a. Solid diachronic evidence is based on long written history: **Old vs. Modern Japanese textual record**
 - The diachronic argument beyond Javanese is inferential.
- b. We combine (a) with:
 - Inherited Austronesian formatives, based on long scholarship research in AN historical linguistics (Blust 2013, Ross 2015, Kitada 2021);
 - Synchronic micro-comparison (including our own recent fresh data, particularly based on ***Max Planck Institute (MPI) reciprocal stimulus video set***;
 - Known pathways of voice/valency reanalysis;
 - Distribution of reciprocal, middle, sociative, and pluractional meanings

The goal is not to reconstruct a single linear history for every language, but to identify (i) **recurrent reallocation patterns**, and (ii) **offer an LFG analysis**

Preview of the three patterns

Type/ Pattern	Historical material	Synchronic outcome	Semantic effect	Reflex (Language)
A	* <i>pa(R)-</i>	Reciprocal/middle absorbed into valency/causative system; full/partial syncretism (<i>p-/b-</i> or <i>m-</i> pairs)	A=U role fusion; object suppression	<i>pa-</i> 'CAUS' (Mandailing) <i>pa-</i> 'RECIP' (Sipora Mentawai) <i>pa-</i> 'RECIP' (Kodhi) <i>be-</i> 'RECIP.MID' (Sigulai, Devayan) <i>ma-</i> 'RECIP.MID' (Old Javanese, Balinese) <i>ber-</i> 'RECIP.MID' (Indonesian)
B	* <i>si-</i>	Sociative/pluractional layer persists or is reanalysed; co-occurring with the reflex of * <i>pa(R)-</i>	Sequential/pluractional reciprocal subtype	<i>besi-</i> 'RECIP' (Sigulai, Devayan) <i>masi-/pasi-</i> 'TR' (Sipora Mentawai) <i>marsi-</i> (- <i>an</i>) 'REFL/RECIP' (Mandailing) <i>bersi-</i> 'RECIP' (Indonesian)
C	*- <i>an</i> / REDUP	- <i>an</i> /REDUP takes over reciprocal-pluractional packaging	Event plurality, distributivity, sequentiality	- <i>an</i> /REDUP+< <i>in</i> > 'RECIP' (Modern Javanese) <i>REDUP with vowel alternation</i> 'RECIP' (Balinese)

Pattern A: **pa*- absorbs reciprocal/middle (*R-), resulting in CAUS-RECIP.MID syncretism

A single reflex of CAUS **pa*- can form:

1. Primarily causative predicates:
 - e.g. Mandailing CAUS *pa*- (4)
2. Primarily reciprocal/middle predicates
 - e.g. Sipora; Kodhi RECIP.MID *pa*- (5) vs (6)
3. Both CAUS and RECIP predicates
 - e.g. Nias CAUS/RECIP *f*-/*fa*-/*fe*-

Mandailing:

(4) *u=pa-use* *aek*
1sg.A.UV=**CAUS**-spill water
'I poured the water.'

Kodhi:

(5) *a=tobhoko=ya*
3pl.NOM=**meet**=3sg.ACC
a komi
DEF.sg Komi
'They met the Komi.'

(6) *a=pa-tobhoko*
3pl.NOM=**RECIP.MID-meet**
'They met (each other).'
-> **Object suppression**

Pattern A continued: Nias and the causative/middle issue

Three-way contrast in Nias:

- *m-* series as dedicated MID prefixes
 - e.g. on body action verb stems (7)
- *f-* series as dedicated CAUS prefixes
 - e.g. on transitive and intransitive stems (8)
- *f-* series as RECIP prefixes
 - e.g. on transitive stems (9)

Nias:

- (7) *m-e'e* *niβa=nia*
MID-cry sibling.MUT=3sg.POSS
'Her sister is crying.'
(Brown 2001: 118)
- (8) *hanata* *zi=f-e'e* *ribka*
who REL.MUT=**CAUS**-cry PN
'Who made Ribka cry?'
(Brown 2001: 237)
- (9) *fa-bözi* *ira*
RECIP-hit 3pl.MUT
'They hit each other.'
(Brown 2001: 563)

CAUSE-RECIP/MID syncretism of the reflex of **pa-*: Why causative and reciprocal can meet

- **Causatives** introduce an external initiator/causer
- **Reciprocals** involve mutual affectedness among participants: ‘A=U fusion, A-U roles reversal’
- **Middles** reduce or internalise external affectedness

In a **plural subject**, these can converge:

- The participant set is both initiator (A) and undergoer (U)

We propose a simple schema for CAUSE-MID syncretism associated with **pa-*

- **CAUSE_fused:**
Plural participant set = Initiator + Affected participant
⇒ A and U are fused at a-structure
⇒ Reciprocal-middle reading becomes available when the A-U role reversal is licensed semantically.

Pattern B: characterized by the presence of the reflex of PMP **si-*, typically as sociative/pluractional

- Kitada (2021) reconstruction of **si* only for WISP/PMP (not PAN):
3 possible original functions: (i) plural actors, (ii) reflexive A=U fusion, and (iii) reciprocal (i.e., combining (i) and (ii))
 - In (modern) daughter Sumatran languages we discuss here, the reflex of **si-* is not simply “RECIP” but compositional with an additional layer:
 - Sociative/event-plural/sequential construal
- e.g.
- **Sigulai** distinguishes general reciprocal-middle **be-** from explicitly sequential/pluractional **besi-**, while
 - **Devayan** has a clearer split between actor voice **maN-**, reciprocal **maN-si-**, and passive **ni-**

On the *be-/besi-* contrast in Sigulai

Sigulai form	Morphological composition	Reading
be-V	MID/RECIP	general reciprocal-middle
be-si-V	MID + sociative/pluractional	sequential, distributed, or explicitly reciprocal interaction

- The contrast is **not “reciprocal vs non-reciprocal”**, but
- **General reciprocal-middle vs enriched reciprocal-pluractional**

(10) *dalua yalafe afainga ana ila be-bukha*
 two woman recent just 3pl.ABS **MID-meet**
akhuli ila besi-sapo
 immediate 3pl.ABS **RECIP-greet**

‘The two women just **met**, and they immediately **greeted each other**.’

Devayan: Clear synchronic split

The reflex of **si-* can remain synchronically productive as a reciprocal derivational layer within the voice system, e.g.

Devayan *tenang* ‘kick’:

- Actor voice (AV): ***manenang*** ‘kick’
maN-tenang
AV-tenang
- AV.reciprocal: ***mansi-tenang***
AV.**RECIP**-tenang
‘kick each other’
- Passive voice ***ni-tenang*** ‘be kicked’
PASS-kick

BUT, for a symmetric relational predicate, *be-* is used:

- Intr.(RECIP.)MID: ***be-pale*** ‘hug each other’
RECIP/MID-hug

- (11) *Si Wawan, aya manenang si Novin.*
ART Wawan 3SG AV.kick ART Novin
‘Wawan kicked Novin.’
- (12) *Si Wawan alek si Novin,*
ART Wawan and ART Novin
eksiraya sia mansi-tenang.
3PL AV.SI-kick
‘Wawan and Novin kicked each other.’
- (13) *Si Wawan aya ni-tenang si Novin.*
ART Wawan 3SG PASS-kicked ART Novin
‘Wawan was kicked by Novin.’
- (14) *Sia be-salam*
3PL RECIP/MID-greet/shake.hands
‘They shook each others’ hands.’

Sipora: Exponent remains, function migrates

- Sipora shows a different outcome:
 - **si-* reflexes remain visible on the verb, but the earlier reciprocal/pluractional contribution is no longer compositionally transparent
- Reflexes of **si-* in Sipora
 - ***pasi-matei-ake'*** in the transitive/non-reciprocal environment
 - ***masi-lakkai-ake'*** 'hug X' as transitive/non-reciprocal
 - ***pa-lakkai*** 'hug each other'
- **si-* is **formally retained**, as part of a **transitive marker**, while its **reciprocal-pluractional** contribution is **absorbed by *pa-***:
 - Sipora is therefore a key case of **formal retention without functional retention**: the exponent survives, but the reciprocal function migrates elsewhere.

Joni **pasi**-matei-ake' si-rimanua
Joni (AV.)TR-dead-APPL AG.NMLZ-alive
"They hug the person."

Joni **masi**-lakkai-ake' si-rimanua
Joni AV.TR-hug-APPL AG.NMLZ-alive
"Si Joni hug the person."

ruwa si-nanalep **pa**-lakkai sia
two AG.NMLZ-female RECIP-hug 3PL
"The two women, they hug each other."

Aku samba si Joni a-**pa**-sipak kai
1SG and Si Joni PST-RECIP-kick 1PL.exc
'Joni and I, we kicked each other.'

Pattern C: **-an* and/or reduplication can take over reciprocal-pluractional packaging

- Where dedicated reciprocal material weakens, **-an* (which often comes with reduplication as in Modern Javanese) can take over the expression of event plurality, distributivity, and sequential reciprocity

Language	Form	Reading
Indonesian	<i>ber-peluk-an</i> 'hug each other'	reciprocal, often simultaneous
Coll. Indo	<i>peluk-an</i> 'hug each other'	reciprocal, often simultaneous
Javanese	<i>rangkul-an</i> 'hug each other'	simultaneous reciprocal
Javanese	<i>rangkul-rangkul-an</i> 'hug each other'	repeated/sequential reciprocal
Balinese	<i>sogok-sogok-an</i> 'push each other'	repeated/sequential reciprocal
Balinese	<i>sogak-sogok</i> 'push each other' * <i>sogok-sogok</i> vs. <i>sogok</i> 'push P'	repeated/sequential reciprocal in different manners

Old Javanese vs. Middle and (early) Modern Javanese: Patterns A > C (Qomariana 2026)

- The textual record supports the following trajectory:

Period	Attested reciprocal resources	
Old Javanese (AD 700 – 1299)	<i>(m)a-V, (m)a-V-an, (m)a-REDUP-V-an, silih</i> , lexical reciprocals, REDUP+<in>	Pattern A; no attested reflex of *si-
Middle Javanese (AD 1300 -1699)	<i>ma-</i> constructions, reduplication, <i>-an</i> , alternating <i>V-V</i> formations	
Early Modern Javanese (AD 1700-1899)	residual/literary <i>ma-</i> , <i>-an</i> , reduplication, <i>-in-</i> , and increasing use of <i>silih, padha, sami</i>	
Modern Javanese AD 1900 - now	productive <i>V-an, REDUP-V-an, partial reduplication + -an, V-V, padha, siji lan sijine</i>, and lexical reciprocity; productive reciprocal <i>ma-</i> is absent	Pattern C; no attested reflex of *si-

Old Javanese vs. Modern Javanese: Patterns A > C (Qomariana 2026)

Examples of **Old Javanese** *ma-*:

- *ma-* **without *-an***: MIDD *ma-*, with **reciprocity is plausibly supplied largely by lexical relational symmetry of the root.**

ma-temu ‘meet’

ma-pagut ‘clash/come into contact’

ma-prang ‘fight’

ma-gelut ‘wrestle’

- *ma-* **with *-an***: **reciprocity is constructed grammatically** rather than merely recovered from the lexical meaning of the root: the root expresses an ordinary asymmetric relation.

ma-mukul-an ‘hit each other’

ma-kacacah-an ‘cut/slash each other’

ma-manah-an ‘shoot arrows at each other’

Old Javanese vs. Modern Javanese: Patterns A > C (Qomariana 2026)

Old Javanese:

prang *ning* *sura-(a)sura* *pwa* *sara* *pada* *tawantah*
war between god-demon PART fierce together really

ma-temu *ing* *tengah* *lwir* *guntur* ***ma-pagut***
MID-meet LOC middle like thunder MID-clash

ma-tambah *i* *harep* *nora-ng-ucap* *mundura* (AW25.4)
MID-add LOC front not-AV-say step.back

‘The war between the gods and the demon-giants was fierce, (they) met in the middle like clashing thunder, increasing (fierce) at the front, with no thought of retreat.’

Modern Javanese (Patterns C) and other languages with Pattern A

Modern Javanese:

Wong loro **rangkul-an**.

person two hug-RECIP.MID

'The two persons hug each other.' (VR.07)

Sipora Mentawai:

ruwa si-nanalep **pa-lakkai** sia

two AG.NMLZ-female RECIP.MID-hug 3PL

'The two women hug each other.'



Balinese:

Aneke nto **ma-gelut**.

person two MID-hug

'The persons hug each other.'

Devayan:

Sia **be-pale**.

3PL MID-hug

'They hug each other.'

Why *-an* (<PAn LV **-an* / PV **-ən*) / REDUP are natural hosts

U-oriented **-an*

event/result/U-oriented
nominalization:
→ A-backgrounding
→ **event/result foregrounding**
→ compatible with reciprocal-
middle (A=U fusion) reanalysis

Event nominalisation **-an*

V → event unit/kind/result
→ **possibly countable,
repeatable, distributable**
→ natural host for VNUM /
RECIP-TYPE

REDUP

repetition / plurality /
distribution
→ natural host for
sequential and distributive
reciprocity

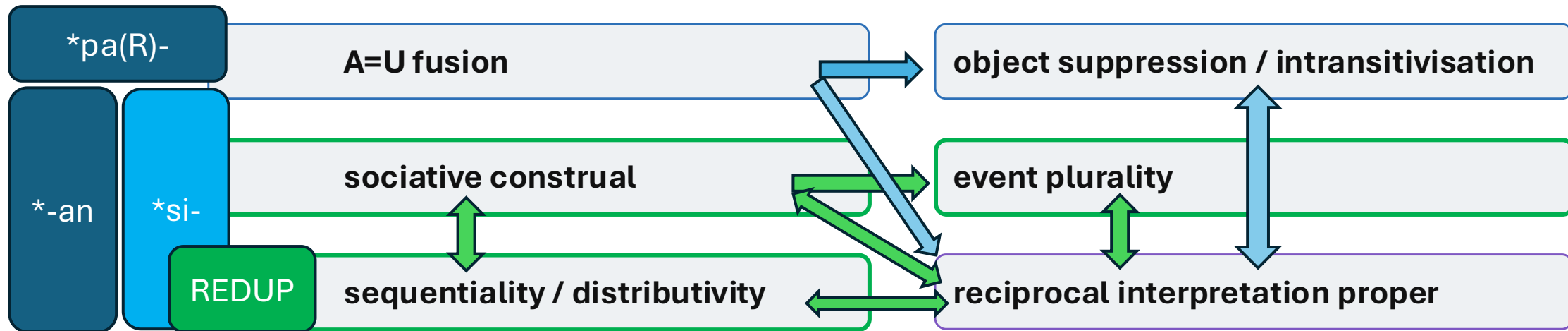
****-an* does not necessarily source reciprocity proper;
it is a natural host/exponent for event-structural subcomponents of reciprocity.**

Patterns combined: *marsi- -an* in Mandailing

- Diachronically **p<um>a<R>-si- -an* with **pa-*, **si-*, & **-an* (Kaufman 2009)
- Compositional? But...
 - No component is separable
- Non-compositional? But...
 - MID *mar-dalan* ‘to walk’ vs MID.**PL** *mar-dalan-an* ‘to walk around’
 - RECIP.MID *mar-adu* ‘to fight’ vs RECIP.**PL** *marsi-adu* ‘to fight against each other’
 - MID *mar-poda* ‘to teach’ vs **REFL** *marsi-poda* ‘to teach oneself’ vs **RECIP** *marsi-poda-an* ‘to teach each other’

Interim empirical generalisation: Meaning migration

Across the languages that we examine, reciprocal meaning is not tied to a single morpheme. Different subcomponents are redistributed.



Meaning migration =
Redistribution of semantic labour across morphology, a-structure, f-structure and sem-structure.

Principles guiding feature reallocation

Principle	Definition	Effect in this paper
Structural proximity	Adjacent / tightly integrated exponents are likely to fuse, be resegmented, or be reanalysed together.	<i>pa(R)-</i> , <i>si-</i> , <i>-an</i> , REDUP cluster within the predicate complex.
Feature affinity	Features migrate to hosts with overlapping semantic or grammatical content.	<i>-an</i> and REDUP already encode event packaging, plurality, repetition, distribution.
Economy of exponence	If neighbouring exponents encode overlapping meanings, one may be lost, absorbed, or functionally reassigned.	<i>si-</i> may weaken when its contribution is recoverable from <i>pa-</i> , <i>-an</i> , REDUP, or the construction.

Feature affinity: why reciprocal submeanings migrate

Feature reallocation is expected
when two exponents are structurally close and semantically affine.

Earlier allocation

**pa(R)-* → CAUS-MID / A=U
**-an* → EVENT / RESULT / U-oriented
nominalisation
**REDUP* → repetition / plurality
**si-* → SOCIATIVE / PLURACTIONAL /
RECIP-TYPE

Later allocation (but earlier allocation may also be [partially] retained)

pa- → MID / RECIP / A=U
-an → VNUM / RECIP-TYPE / event
packaging
REDUP → sequential / distributive
reciprocity
si- → lost, fused, or non-compositional

Reciprocal meaning migrates to
where the grammar already has the right semantic affordances

LFG ANALYSIS

Why LFG?

- The data require a model in which form, grammatical function, argument structure, and semantics can change semi-independently.
- **LFG is useful** because it does not force every change to be stated at one level:
 - *m-structure*: morphological exponence;
 - *c-structure*: phrase structure position;
 - *a-structure*: participant-role configuration;
 - *f-structure*: grammatical functions and features;
 - *sem-structure*: reciprocal relation, event plurality, quantificational/distributive interpretation.

The LFG framework allows an explicit analysis of diachronic typology:

- treating reciprocal change as small reanalyses in the correspondence between different levels/modules rather than as simple loss of function.

Sem-structure: reciprocity elements

- Dalrymple et al. (1998) and Haug & Dalrymple (2020) provide the formal semantic background; our paper asks how such semantic content is redistributed diachronically across morphosyntax

- *sem-str*:
 - RECIP-REL : $\text{RECIP}_{X,E}$
 - PART-SET : $X = \{x_1, x_2, \dots\}$
 - MACRORoles : A, U
 - ROLE-PERMUTATION : +
 - EVENT-PLURALITY : $\pm$
 - RECIP-TYPE : simultaneous / sequential / distributive

$$\text{RECIP}_{X,E} \left[\sum_{e \in E} \text{do}'(x_i, [V'(x_i, x_j)])_e \right], i \neq j$$

$$\begin{aligned} \text{A-SET}(E) &= \text{U-SET}(E) = X_{\text{PL}} \\ \text{ROLE-PERMUTATION}(E): \\ &\langle \text{A}:x_i, \text{U}:x_j \rangle_e \leftrightarrow \langle \text{A}:x_j, \text{U}:x_i \rangle_{e'} \end{aligned}$$

Sem-structure: RRG-style LCS elements

- We adopt RRG-style Logical Conceptual Structure representation, which allows us to distinguish **types of “causation”**, and **related semantic constraints** associated with the stem (e.g. ‘scalar’ [SCALE+] associated with CAUSE_fused (*pa-*), but not with CAUSE_disjoint) (cf. Arka et al 2026).
 - **CAUSE is not one thing:**
causation relates two Logical Structures: α **CAUSE** β , where α and β may be **states, activities, achievements, accomplishments**, etc.
- **Lexical-aspectual class matters:**
 - BECOME pred'(x) = telic change into a result state
 - do'(x, [pred'(...)]) = activity/process
 - PROC/SCALE+ pred'(x,d) = scalar process/increase along a degree scale
 - α CAUSE β = causative relation between event structures

Distinguishing CAUSE_fused from CAUSE_disjoint in LCS

Type	LCS schema	Example
Strong CAUSE_fused: A=U non-disjointness REFL or RECIP set overlap	(a) REFL: $\Sigma_{i,j} [\text{do}'(xi, V'(xi,xj))]$, $A=U=xi$ (b) RECIP _{X,E} $[\Sigma_{e \in E} \text{do}'(xi, [V'(xi,xj)])e]$, $i \neq j$ $A\text{-SET}(E) = U\text{-SET}(E) = X_{PL}$	a. Mandailing <i>marsipoda</i> ‘teach oneself’ b. Enggano <i>ki-pa-pù-pù</i> ‘see each other’ (vs. <i>ki-pù</i> ‘see P’), <i>pa-kom</i> ‘meet each other’; Sipora Mentawai <i>pa-sipak</i> ‘kick each other’
Weak CAUSE_fused: ¹ scalar/processual affectedness without A=U	$[\text{do}'(A)] \text{ CAUSE } [\text{PROC SCALE} + \text{pred}'(U,d)]$	Indonesian <i>per-besar</i> ‘make bigger/enlarge’
CAUSE_disjoint	$[\text{do}'(A)] \text{ CAUSE } [\text{BECOME pred}'(U)]$, $A \neq U$	Indonesian <i>besar-kan/besar-in</i> ‘make big’; <i>mati-kan/mati-in</i> ‘make dead’
Collective/pluractional middle	$[\text{do}'(X_{pl}, V'(X_{pl}))] / \text{COLL-PROC } V'(X_{pl})$	Enggano <i>ki-pa-ru-ru</i> ‘gather together’

Note 1: causation is fused with internal scalar development of U, a middle-compatible property; the scalarity of *per-* overlaps with middle semantics, but only partially.

M-structure: GPFM (Spencer 2010, 2013)

$GPF(\langle \text{LEXEME}, \sigma \rangle) = \langle \text{LEXEME}' \rangle$

component functions:

fFORM → morphophonological form

fSYN → syntactic distribution / valency

fSEM → LCS / semantic-constructional content

fLI → lexemic identity / relatedness

For our present discussion, the feature bundle σ includes morphosyntactic-semantic features:

{transitive, (speech.)middle, pluractional, reciprocal, cause.fused, cause.disjoint, actor.voice, ... }

General schema: Kodhi MID *pa-*

$GPF_RECIP-MID(\langle L_V, \sigma: \{V, TRANS, MID, RECIP\} \rangle)$
= $\langle RECIP-MID(L_V), \sigma' \rangle$

$fFORM(\langle L_V, \sigma \rangle)$
= $\langle pa-L, \sigma' \rangle$

$fSYN(\langle L_V, \sigma: \{TRANS: \langle SUBJ_i, OBJ_j \rangle\} \rangle)$
= $\langle pa-L, \sigma': \{INTRANS: \langle SUBJ_X \rangle\} \rangle$

$fSEM(\langle L_V, \sigma \rangle)$
= $\langle pa-L,$
 $RECIP(X, E) [\sum_{e \in E} LS_L(x_i, x_j)e],$
 $x_i, x_j \in X, i \neq j,$
 $A-SET(E) = U-SET(E) = X_{PL},$
 $ROLE-PERMUTATION(E) = + \rangle$

$fLI(\langle L_V, \sigma \rangle)$
= $RECIP-MID(L_V)$

M-structure and GPFM

(Spencer 2010, 2013)

$GPF(<LEXEME, \sigma>) = <LEXEME'>$

component functions:

fFORM → morphophonological form

fSYN → syntactic distribution / valency

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For our present discussion, the feature bundle σ includes morphosyntactic-semantic features:

{transitive, (speech.)middle, pluractional, reciprocal, cause.fused, cause.disjoint, actor.voice, ... }

SHORT General schema:

fFORM: $L \rightarrow pa-L$

fSYN: TRANS:<SUBJ_i,OBJ_j> → INTRANS:<SUBJ_X>

fSEM:

RECIP(X,E) [$\sum e \in E LS_L(xi,xj)e$]

$xi,xj \in X; i \neq j$

A-SET(E) = U-SET(E) = X_{PL}

ROLE-PERMUTATION(E) = +

fLI: $L \rightarrow RECIP-MID(L)$

Deriving **patobhoko** from **tobhoko** 'meet P'

fFORM: $L \rightarrow pa-tobhoko$

fSYN: INTRANS:<SUBJ_X>

fSEM: RECIP(X,E) [$\sum e \in E meet'(xi,xj)e$]

$xi,xj \in X; i \neq j$

A-SET(E) = U-SET(E) = X_{PL}

ROLE-PERMUTATION(E) = +

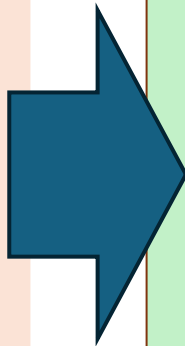
fLI: RECIP-MID(meet')

f-str, m-str, & sem-str correspondence: Old Javanese

- The morphology module provides fully inflected/derived words:
 - *panah* ‘arrow’, N ; *panah* ‘shoot.with.arrow’, V
 - *ma-panah* ‘
 - *amanah* ‘shoot with an arrow’
 - *ma-manah-an* ‘shoot one another with arrows
 - *(m)a-pana(h)-panah-an* ‘shoot one another with arrows, many times’

GPFM-style M-structure:

GPF_TR (<*panah*_V σ:{TRANS, V, DIRECTED,
AGENTIVE, DISJOINT}>) =
fFORM: <*panah*_V σ’>
fSYN: <*panah*_V σ’:{V, TRANS_L <SUBJ_i OBJ_j>}>
fSEM: <*panah*_V σ’: {do’(xi,[shoot.arrow’(xi,xj)]
REL-TYPE = DIRECTED
AGENTIVITY= +
A-U-RELATION = DISJOINT
...}>.



LFG Lexical Entry:

panah
V
(↑ PRED)= ‘shoot,.with.arrow<(↑SUBJ)(↑ OBJ)> ‘
(↑σ)= do’(xi,[shoot.arrow’(xi,xj)])
(↑σ REL-TYPE)= DIRECTED
(↑σ AGENTIVITY)= +
(↑σ A-U-RELATION)= DISJOINT

f-str, m-str, & sem-str correspondence: Old Javanese

PAN *(<η> 'distributed/pluractional event (Kaufman 2009, 2018)

- The morphology module provides fully inflected/derived words:
 - *panah* 'arrow', N ; *panah* 'shoot.with.arrow', V
 - *ma-panah* '
 - *amanah* (<**aN-panah**; AV-'shoot. with.arrows'
 - *ma-manah-an* 'shoot one another with arrows
 - *(m)a-pana(h)-panah-an* 'shoot one another with arrows, many times'

GPFM-style M-structure:

GPF_**AV**.TR (<*panah*_V, σ:{TRANS, V, **AV**, DIRECTED, AGENTIVE, DISJOINT}>) =

fFORM: <**amanah**_V, σ'>

fSYN: <**amanah**_V, σ':{V, **AV**, TRANS_L <SUBJ_i OBJ_j>}>

fSEM: <**amanah**_V, σ': {do'(xi,[shoot.arrow'(xi,xj)])
REL-TYPE = DIRECTED
AGENTIVITY= +
A-U-RELATION = DISJOINT
...}>.

LFG Lexical Entry:

amanah

V

(↑ PRED) = 'shoot,.with.arrow<(↑SUBJ_i)(↑OBJ_j)> '

(↑ VOICE-TYPE) = AV

(↑σ) = do'(xi,[shoot.arrow'(xi,xj)])

(↑σ REL-TYPE) = DIRECTED

(↑σ AGENTIVITY) = +

(↑σ A-U-RELATION) = DISJOINT

f-str, m-str, & sem-str correspondence: Old Javanese

- The morphology module provides fully inflected/derived words:
 - *panah* ‘arrow’, N ; *panah* ‘shoot.with.arrow’, V
 - *ma-panah* ‘
 - *amanah* (<**a****N**-*panah*; ‘AV-shoot. with.arrows’
 - **ma**-*manah*-**an** (<**ma**-(a)**N**-(p)*anah*-**an**) ‘shoot **one another** with arrows’
 - (m)*a-pana(h)-panah-an* ‘shoot one another with arrows, many times’

GPFM-style M-structure:

GPF_**RECIP-MID**(<(a)manah_v, σ:{TRANS, V, DIRECTED}>) =
fFORM (**ma-(a)manah-an**_v, σ')
fSYN (<**mamanahan**_v, σ':{V, MID, RECIP, INTRANS_L
<SUBJ_i /j>)
fSEM(< **mamanahan**_v,
σ':{ RECIP(X, E) [Σe∈E do'(A(e), [shoot.arrow'(A(e),U(e))])],
|X| ≥ 2, A(e),U(e) ∈ X, A-SET(E) = U-SET(E) = X_{PL}
ROLE-PERMUTATION(E) = +, ... >.

LFG Lexical Entry:

mamanahan

V

(↑ PRED)= ‘shoot,.with.arrow<(↑ SUBJ_i/j)> ‘

(↑ VOICE-TYPE) = RECIP-MID

$$(\uparrow \sigma) = \text{RECIP}(X, E)$$
$$[\Sigma e \in E \text{ do}'(Ai(e), [\text{shoot.arrow}'(Ai(e), Uj(e))])],$$
$$(\uparrow_{\sigma} \text{ROLE-PERMUTATION}(E) = +$$
$$(\uparrow\sigma \text{ VERB.NUM}) = X_{PL} \quad (\uparrow\sigma \text{ AGENTIVITY}) = +$$
$$(\uparrow_{\sigma} \text{ REL-TYPE}) = \text{DIRECTED}$$

...

RECIP diachrony in Japanese

Reallocating RECIP-related meaning: **asymmetric/directional** verbs

OLD Javanese

- **ma-manah-an** (<**ma**-(a)**N**-(p)**anah-an**>
'shoot **one another** with arrows'
- **(m)a-pana(h)-panah-an** 'shoot **one another**
with arrows, many times'
REDUP

Modern Javanese

- * **ma-manah-an**
- **pana(h)-panah-an** 'shoot **one another**
with arrows (many times)'
REDUP

(↑σ RECIP-EXTENT)=HIGH

Unlike OJ *ma-V-an*, MJ re-allocates RECIP-related meaning primarily to the *V-an* construction

Old Javanese:

mamanahan / **ma-pana(h)-panah-an**

V

(↑ PRED)= 'shoot,.with.arrow<(↑ SUBJ_i)(↑ OBJ_j)> '

(↑ VOICE-TYPE) = RECIP-MID

(↑σ)= RECIP(X, E)

[Σe∈E do'(A(e), [shoot.arrow'(A(e),U(e))])],

(↑σ ROLE-PERMUTATION(E) = +

(↑σ AGENTIVITY) = +

(↑σ REL-TYPE) = DIRECTED

...

Modern Javanese:

panah-panahan / * **panahan**

V

(↑ PRED)= 'shoot,.with.arrow<(↑ SUBJ_i/j)> '

(↑ VOICE-TYPE) = RECIP-MID

(↑σ)= RECIP(X, E)

[Σe∈E do'(Ai(e), [shoot.arrow'(Ai(e),Uj(e))])],

(↑σ ROLE-PERMUTATION(E) = +

(↑σ VERB.NUM)= X_{PL}, (↑σ AGENTIVITY) = +

(↑σ REL-TYPE) = DIRECTED

...

RECIP diachrony in Javanese

*Reallocating RECIP-related meaning: **symmetric verbs***

• Old Javanese:

ma-temu 'meet';
ma-pagut 'clash/come into contact';
ma-prang 'fight';
a-peluk 'hug (each other)';
ma-gelut 'wrestle'

• Modern Javanese:

ke-temu/**temuan* 'meet';
tabrak-an/**pagutan* 'clash/come into contact';
rangkul-an 'hug each other';
prang 'fight';

($\uparrow\sigma$ ROOT-PROFILE REL-TYPE) =
{**SYMMETRIC** |
COPARTICIPATORY |
DIRECTED |
...}

Old Jav:

(m)a-V
(m)a-V
(m)a-V-**an**

Modern Jav:

(REDUP.)V -an
V
REDUP.V-**an**

Example Root:

pagut/*tabrak* 'clash'
perang 'fight'
panah 'shoot.arrow'

The same feature ($\uparrow\sigma$ VERB.NUM) = X_{PL} (i.e. a plural (sub)event set, with a plural A-U participant set) has different allocations in OJ and MJ m-str: *ma-* -*an* vs. *REDUP-an*; ($\uparrow\sigma$ ROOT-PROFILE REL-TYPE) is also critical. 38

RECIP diachrony in Javanese

Reallocating RECIP-related meaning: **symmetric** verbs

• Old Javanese:

ma-temu 'meet';
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• Modern Javanese:

ke-temu/**temuan* 'meet';
tabrak-an/**pagutan* 'clash/come into contact';
rangkul-an 'hug each other';
prang 'fight';

($\uparrow\sigma$ ROOT-PROFILE REL-TYPE) =
{SYMMETRIC |
COPARTICIPATORY |
DIRECTED |
...}

Old Jav:

(m)a-V
(m)a-V
(m)a-V-an

Moden Jav:

(REDUP.)V -an
V
REDUP.V-an

Example Root:

pagut/tabrak 'clash'
perang 'fight'
panah 'shoot.arrow'

The same feature ($\uparrow\sigma$ VERB.NUM) = X_{PL} (i.e. a plural (sub)event set, with a plural A-U participant set) has different allocations in OJ and MJ m-str: *ma-* -an vs. *REDUP-an*; ($\uparrow\sigma$ ROOT-PROFILE REL-TYPE) is also critical. 39

Symmetric verbs in other Indonesian AN languages: RECIP.MID constructions

- **Old Javanese:**

ma-temu 'meet';
ma-pagut 'clash/come into contact';
ma-prang 'fight';
ma-gelut 'wrestle'

- **Devayan:**

be-pale 'hug each other';
be-salam 'shake hands'

- **Balinese:**

ma-gelut 'hug each other';
ma-salam-an 'shake hands'

- **Modern Indonesian:**

ber-temu 'meet' (accidental);
ber-adu 'clash/come into contact';
ber-gelut 'hug each other';
ber-perang 'fight'; **ber-salam-an** 'shake hands'

Deriving Devayan **be-pale**:

GPF_RECIP-MID($\langle L_V, \sigma: \{V, \text{SYMMETRIC}, \dots \} \rangle$)
 = $\langle \text{RECIP-MID}(L_V), \sigma' \rangle$

fFORM($\langle L_V, \sigma \rangle$)
 = $\langle \text{be-pale}, \sigma' \rangle$

fSYN($\langle L_V, \sigma: \{ \text{TRANS}: \langle \text{SUBJ}_i, \text{OBJ}_j \rangle \} \rangle$)
 = $\langle \text{be-pale}, \sigma': \{ \text{INTRANS}: \langle \text{SUBJX} \rangle \} \rangle$

fSEM($\langle L_V, \sigma \rangle$)
 = $\langle \text{be-pale},$
 $\text{RECIP}(X, E) [\sum_{e \in E} \text{LS}_L(x_i, x_j)e],$
 $x_i, x_j \in X, i \neq j, \text{A-SET}(E) = \text{U-SET}(E) = X_{PL},$
 $\text{REL-TYPE} = \text{SYMMETRIC}$
 $\text{ROLE-PERMUTATION}(E) = + \rangle$

fLI($\langle L_V, \sigma \rangle$)
 = $\text{RECIP-MID}(\text{hug})$

Mandailing RECIP constructions:

mar-/marsi-/marsi- -an

- ($\uparrow_{\sigma}$ ROOT-PROFILE REL-TYPE) = SYMMETRIC
 - RECIP.MID *mar-adu* ‘to fight’
 - RECIP.PL *marsi-adu* ‘to fight against each other’
- ($\uparrow_{\sigma}$ ROOT-PROFILE REL-TYPE) = DIRECTED
 - MID.INT *mar-poda* ‘to teach’
 - REFL *marsi-poda* ‘to teach oneself’
 - RECIP *marsi-poda-an* ‘to teach each other’

Key points:

- Reciprocal is **constructional**, and **root-type sensitive**
- *mar-*: establishes the middle/subject-oriented verbal domain
- *si-*: imposes (i) A=U fusion, applicable for reflexivity (i.e. **individual** level) and reciprocity (i.e. **set** level).
($\uparrow_{\sigma}$ A/U-FUSION) = {NONE | INDIVIDUAL | SET} (ii)
participant/event plurality
- *-an*: supplies an articulated **plural event domain**, allowing **role permutation** across subevents

fFORM: *marsi-poda*

fSEM: do'(x,[teach'(x,x,t)])
A/U-FUSION = INDIVIDUAL
A(e) = U(e) = x
PART-NUM = SG
ROLE-PERMUTATION = -
REL-TYPE = DIRECTED

fLI: REFL-MID(TEACH')

fFORM: *marsi-poda-an*

fSEM: RECIP(X,E) [$\Sigma e \in E$ do'(A(e),
[teach'(A(e), U(e),t))]]
A/U-FUSION = SET
 $|X| \geq 2, |E| \geq 2$
PART-NUM = PL
ROLE-PERMUTATION = +
REL-TYPE = DIRECTED

fLI: RECIP-MID(TEACH')

Sipora: *si-* containing form without reciprocity

masi-lakkai-ake'

V.TR<SUBJ, OBJ>

AV.TR-hug-APPL

pa-lakkai

V.INTRANS<SUBJ>

RECIP-hug

'hug each other/one another

pa-sipak

V.INTRANS<SUBJ>

RECIP-kick

kicked each other/one another.'

• Diachronic typological contrast of *si-*:

	Sipora	vs.	Devayan	vs.	Mandailing	vs.	Modern Jav
• FORM	ma-si-L		maN-si-L		mar-si-L-(an)		• Same RECIP-MID related SEM features are expressed without si in Old & Modern Jav. • No claim is made here that si has been lost in the history of Javanese
• SEM	RECIP – A/U-FUSION = –		RECIP + A/U-FUSION SET ROLE-PERMUTATION +		{REFL + or RECIP +} A/U-FUSION {INDIV SET} ROLE-PERMUTATION {– +}		
• Retention:	FORM only		FORM & SEM		FORM & SEM		

GPF_TR(<LAKKAI_v, σ:{DIRECTED, TRANS}>)) =

fFROM: lakkai → masi-lakkai-ake'

fSYN: <SUBJ:_A, OBJ:_U>

fSEM: hug'(A,U) ; RECIP = –

fLI: TRANSITIVE-HUG (LAKKAI')

GPF_RECIP.MID(<LAKKAI_v, σ:{DIRECTED, TRANS}>)) =

fFROM: lakkai → pa-lakkai

fSYN: <SUBJ_x>

fSEM: A/U-FUSION = SET A-SET(E)=U-SET(E)=X
ROLE-PERMUTATION = + |X|≥2

fLI: RECIP.MID-HUG (LAKKAI')

Diachronic typological contrast: broader picture with augmented reciprocity

- Augmented reciprocity (i.e., typically involving ‘big’ plural participants/(sub)events) is expressed by a reciprocal construction with reduplication containing **voice marking AV or UV, or analytically with saling (Indo/Balinese), silih (Javanese)**:
 - Old Javanese: *tulung-t<in>ulung* ‘help one another’, BUT
 - Modern Javanese: *tulung-tulung-an* ‘help one another’
 - Devayan: *tenju-menenju* ‘punch each other (repeatedly)’
 - Indonesian: *tolong-menolong*/**tolong-tolong* ‘help each other’, *saling tolong*, *saling tolong-menolong*

Morphological attrition & re-exponence

MORPHOLOGICAL LOSS ≠ SEMANTIC LOSS

Older grammar:

- more voice/middle/reciprocal exponents



- attrition/reanalysis

Daughter grammar:

- fewer inherited exponents
- but reciprocal meaning persists



re-exponence through:

- REDUP · -an · surviving AV · *saling* · pa-

DOCUMENTED RE-EXPONENCE

Older Javanese:

- Productive MIDV, AV, UV/PASS<in>
tulung-t<in>ulung REDUP-L<UV.FORM>L



- loss of productive <in>

Modern Javanese:

- but reciprocal meaning persists
- extended functional load of -an:
tulung-tulung-an REDUP(L)-an

re-exponence through:

- REDUP · -an · surviving AV · *saling* · pa-

Three (Morphological) Exponents, same RECIP output

- OJ L–UV(L) *tulung-t<in>ulung*
- MJ REDUP(L)-an *tulung-tulung-an*
- IND L–AV(L) *tolong-menolong*



All with same f-str and sem-str:

$\langle A, U \rangle \rightarrow \langle \text{SUBJ}_X \rangle$
 $A\text{-SET}(E) = U\text{-SET}(E) = X$
 $\text{ROLE-PERMUTATION} = +$

Theoretical payoff beyond Austronesian

- The Austronesian evidence supports a broader claim:
semantic RECIP-related content can remain stable while its morphosyntactic locus changes.
- LFG provides a formal typology of such change:
 - m-structure loss or fusion;
 - a-structure role fusion;
 - f-structure feature reassignment;
 - sem-structure persistence or subtype shift.
- Diachronic typology can therefore be modelled nicely in LFG as changing correspondence relations across parallel structures.

Conclusion

- **Main claim:**

Reciprocal meaning in Indonesian Austronesian migrates under morphological attrition, as particularly seen in the Old–Modern Javanese contrast.

- Other Indonesian languages discussed in this study Devayan, Sipora Mentawai, Mandailing, and Indonesian show the typological space of possible outcomes.

- Take-home points:

- ✓ **Empirical:**
Indonesian Austronesian languages show recurrent micro-patterns in reciprocal/middle/sociative morphology.
- ✓ **Typological:**
Reciprocal systems change by redistributing subcomponents of meaning: role fusion, event plurality, sequentiality, and mutual affectedness.
- ✓ **Theoretical:**
LFG's parallel architecture models this naturally as reallocation across m-, a-, f-, and sem-structure.

**Diachronic
change is not only
change in form;
it is change in
where grammar
stores meaning.**

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Thank you so much!

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