Long-distance restrictions on distributivity

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Introduction

Cardinal restriction

Adnominal distributive constructions in English, unlike determiner or adverbial distributives, have a “counting quantifier requirement” that prevents such phrases as **most men each* (e.g., Safir and Stowell 1988; Law 2022).

(1) Each man read books / the book(s) / two books. DET

(2) The men each read books / the book(s) / two books. ADV

(3) The men read *books each / *the book(s) each / two books each. ADN

This is also found with, e.g., adnominal *jeweils* in German (Zimmermann, 2002, p. 33).

Cardinal restriction

Shan (Burma, Kra-Dai) has this cardinal restriction not only for adnominal distributives (4) but for any distributive of this type, including determiner distributives, as in (5).

(4)

lukhén	laj	[pâplik	[[săam	kɔ̂	**lăj**]	*(sɔ̆ŋ	pâp)]]
student	get	book	three	CLF.HUM	DIST	two	CLF.B(OOK)

‘The students gets two books for every three students.’

ADNOMINAL

(5)

lukhén	[săam	kɔ̂]	**lăj**	laj	pâplik	*(sɔ̆ŋ	pâp)
student	three	CLF.HUM	DIST	get	book	two	CLF.BOOK

‘Every three students get two books.’ DETERMINER

Distributive Construction in Shan

Distributive key amount

Distributive share amount

… [sǎam kɔ̂ lǎj] (…) sɔ̌ŋ pâp

three CLF.HUM DIST two CLF.B(OOK)

'two (books) for every three (people).'

Methodology

- Data presented here comes from storyboard narratives and acceptability judgments of four Shan speakers.
- In addition, all examples of this construction found among the 14,343 Wikipedia articles written in Shan follow the presented pattern.
- In (6), *nɯŋ luk lǎɯ* 'each bulb' is a determiner distributive construction.

(6) **nɯŋ luk lǎɯ mí [kɔn 6–10 kɔn]**
one CLF.RND DIST have clove six–ten clove
'Each bulb has six to ten cloves.' (Wikimedia 2025)
Note: Some Shan nouns, such as *kɔn*, use the noun as a numeral-classifier.

Distributive Construction in Shan: Key

$$\underbrace{\text{... [sǎam kɔ̂ \quad \textbf{lǎj}]}}_{\text{Distributive key amount}} \text{ (...) } \underbrace{\text{sɔ̌ŋ pâp}}_{\text{Distributive share amount}}$$

...	[sǎam	kɔ̂	**lǎj**]	(...)	sɔ̌ŋ	pâp
	three	CLF.HUM	DIST		two	CLF.B(OOK)

'two (books) for every three (people).'

- Distributive *lǎj/lǎɯ* is also indeterminate pronoun 'which'/'each':

(7)

lukhén	(*nɯŋ)	kɔ̂	lǎj	kɔ	ʔàm	hû	khɔtɔ̀p.
student	one	CLF.HUM	LAJ	PRT	NEG	know	answer

'Each student did not know the answer.'

(Moroney 2025: (38)–(39))

- The numeral is obligatory for the distributive key

Distributive Construction in Shan: Share

- The distributive must be followed by an indefinite quantity expression, the distributive share quantity, such as *(pâplik)* *sɔ̌ŋ pâp* 'two (books)' in (4)–(5). Expressions like *sǎam sɛ̌n khɯnnɤ̌* 'more than three hundred thousand' are also acceptable.
- The distributive share quantity need not be adjacent to the distributive key, but it must follow it
- Indefinite bare nouns and definite expressions do not form proper dist. share quantity

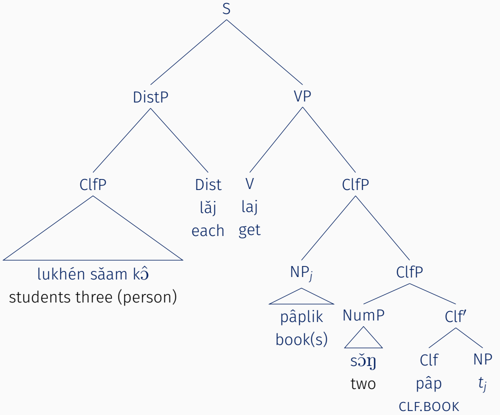
Differences between distributive and indeterminate *lǎj*

distributive	indeterminate
(N) Num Clf *lǎj*	(N) Clf *lǎj*
obligatory quantity-defined share	-
distributive distribution	nominal distribution

distributive distribution: subject, adnominal, floated quantifier

nominal distribution: arguments/adjunct distribution

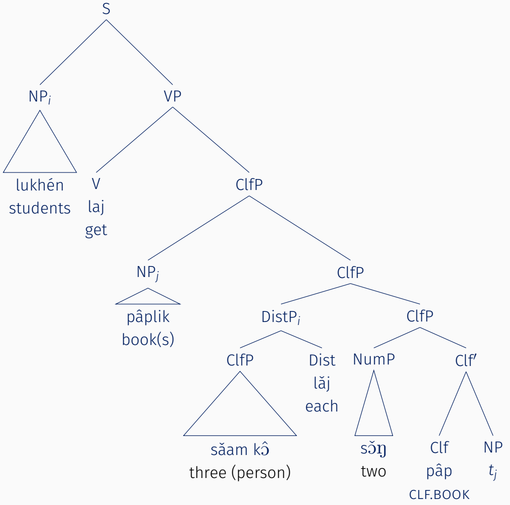
Determiner distributive structure



Distributive marker *lǎj* appears in complementary distribution with demonstratives

Treated here as a D head with roll-up movement in the nominal following Jenks (2011)

Adnominal distributive structure



For adnominal constructions, the distributive key phrase is adjoined to the distributive share (e.g., Zimmermann 2002)

Anaphora

Dependent indefinite expression are a variety of distributive construction that marks the distributive on the distributive share:

(8) BOYS IX-arc-a READ ONE-arc-a BOOK.
‘The boys read one book each.’ (ASL, Kuhn 2017: (1))

Kuhn (2017) argues that dependent indefinites are anaphoric to their licensors given that there is obligatory agreement between the two

Moroney (2026) identifies this as a shared feature between adnominal distributives and dependent indefinites. The adjoined distributive is anaphoric to a previously mentioned plurality.

Proposed account

Apparent long distance selection

Implement with Kratzer and Shimoyama's (2017) account of indefinites as sets of alternatives, using Hamblin function application to maintain the alternatives until they reach the distributive operator, which can place restrictions on acceptable sets.

This connects the indeterminate pronoun use and the distributive use.

Nonoverlap in the restrictor

Shan distributive *lǎj* allows a non-atomic restrictor, e.g., *sǎam kɔ̂* 'three (people)' in (4) but requires non-overlap (Moroney, 2025).

This is modeled with a partition Part:

$$\mathsf{Part}(Q) := \{P \mid P \subseteq Q \wedge \forall x, y \in P[[x \neq y] \rightarrow \neg\exists z[z \leq x \wedge z \leq y]]\}$$
(if $|Q| > 1$, else undefined)

This is similar to English *every* as described by Haslinger et al. (2025)

Cardinal restriction: Non-unique and quantity dependent

- Definites yield singleton sets, while cardinal expressions contain multiple alternatives
- Bare nouns are both divisive and cumulative as defined in Krifka 1989
- Card limits to sets of alternatives that are not divisive and cumulative. (cf. monotonic growth in Law 2022)

$$\text{Card}(Q) := \exists z, x[Q(x) \wedge z \leq x \wedge Q(z)] \\ \rightarrow \exists z', y[Q(y) \wedge z' \leq y \wedge \neg Q(z')] \\ (\text{if } |Q| > 1, \text{else undefined})$$

- The distributive determiner in (9) uses Part for the restrictor and Card for the scope:

(9) $$[\![l\check{a}j]\!] = \lambda Z \lambda \theta \lambda V \lambda e \colon \exists Y \in \text{Part}(Z) \wedge \text{Card}(V). \\ \forall y \in Y[\exists e' \leq e[\theta(e') = y \wedge \exists f \in V[f(e')]]]$$

Determiner

S

$\exists Y \in \mathbf{Part}(\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge \text{student}(z)\}) \wedge$
$\mathbf{Card}(\{\lambda e_v.\text{get}(e) \wedge \text{th}(e) = y \mid \mu(y) = \text{two} \wedge \text{books}(y)\}).$
$\exists e \forall y' \in Y[\exists e' \leq e[\text{agent}(e') = y' \rightarrow \exists f \in \{\lambda e_v.\text{get}(e) \wedge \text{th}(e) = y \mid$
$\mu(y) = \text{two} \wedge \text{books}(y)\} \wedge f(e')]]$

$\lambda V \lambda e : \exists Y \in \mathbf{Part}(\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge \text{student}(z)\}) \wedge \mathbf{Card}(V).$
$\forall y' \in Y[\exists e' \leq e[\text{agent}(e') = y' \wedge \exists f \in V[f(e')]]]$

$\text{Agent}_{\langle v,e \rangle}$
$\lambda e_v.\iota y(\text{agent}(e) = y)$

DP
$\lambda \Theta \lambda V \lambda e : \exists Y \in \mathbf{Part}(\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge \text{student}(z)\}) \wedge \mathbf{Card}(V).$
$\forall y' \in Y[\exists e' \leq e[\Theta(e') = y' \wedge \exists f \in V[f(e')]]]$

$\text{NP}_{\langle e,\langle s,t \rangle\rangle}$
$\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge \text{student}(z)\}$
lukhén sǎam kô̂
three students

D
lǎj
each
$\lambda Z \lambda \theta \lambda V \lambda e : \exists Y \in \mathbf{Part}(Z) \wedge \mathbf{Card}(V).$
$\forall y \in Y[\exists e' \leq e[\theta(e') = y \wedge \exists f \in V[f(e')]]]$

$\text{VP}_{\langle v,t \rangle}$
$\{\lambda e_v.\text{get}(e) \wedge \text{th}(e) = y \mid$
$\mu(y) = \text{two} \wedge \text{books}(y)\}$
laj pâplik sǒŋ pâp
got two books

Adnominal distributive

Adnominal *lăj* has the same definedness conditions but use a relation R, which holds between the event/thematic roles in that event (i.e., between agent and event or agent and theme). This is a slight update of Moroney 2025.

(9) $$[\![l\check{a}j_{\text{DET}}]\!] = \lambda Z \lambda\theta\lambda V \lambda e\colon \exists Y \in \mathsf{Part}(Z) \wedge \mathsf{Card}(V). \\ \forall y \in Y[\exists e' \leq e[\theta(e') = y \wedge \exists f \in V[f(e')]]]$$

(9) $$[\![l\check{a}j_{\text{ADN}}]\!] = \lambda Z \lambda V \lambda x : \exists Y \in \mathsf{Part}(Z) \wedge \mathsf{Card}(V). \\ \forall y' \in Y[\exists x' \leq x[x' \in V \wedge R(x', y')]]$$

Adnominal

ClfP

$\lambda x : \exists Y \in \textbf{Part}(\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge z \leq g(1)\}) \wedge \textbf{Card}(\{y \mid \mu(y) = \text{two} \wedge \text{books}(y)\}).\forall y' \in Y$
$\exists x' \leq x[x' \in \{y \mid \mu(y) = \text{two} \wedge \text{books}(y)\} \wedge R(x', y')]$

DP

$\lambda V \lambda x : \exists Y \in \textbf{Part}(\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge z \leq g(1)\}) \wedge \textbf{Card}(V).\forall y' \in Y$
$\exists x' \leq x[x' \in V \wedge R(x', y')]$

$\text{ClfP}_{\langle e,t \rangle}$

$\{z \mid \mu_{\text{human}}(z) = \text{three} \wedge z \leq g(1)\}$
sǎam kɔ̂
three (people)

D
lǎj
each
$\lambda Z \lambda V \lambda x : \exists Y \in \textbf{Part}(Z) \wedge \textbf{Card}(V).\forall y' \in Y$
$\exists x' \leq x[x' \in V \wedge R(x', y')]$

$\text{ClfP}_{\langle e,t \rangle}$

$\{y \mid \mu(y) = \text{two} \wedge \text{books}(y)\}$
pâplik sɔ̌ŋ pâp
two books

Event mereology

- In (9), the distributive share argument, *V*, is a set of functions from events to truth values. This requires the parthood relation in (10) using event mereology.

(10) $f_{\langle\sigma,t\rangle} \leq g_{\langle\sigma,t\rangle}$ iff $\exists e_\sigma, e'_\sigma[f(e) = 1 \wedge g(e') = 1 \wedge e \leq e']$

- With the denotation of *books* as in (11), the VP denotation for *read books* would be as in (12).

(11) $[\![\text{books/pâplik}]\!] = \{\text{a}, \text{b}, \text{c}, \text{a} \bigoplus \text{b}, \text{a} \bigoplus \text{c}, \text{b} \bigoplus \text{c}, \text{a} \bigoplus \text{b} \bigoplus \text{c}\}$

(12) $[\![\text{VP}]\!] = \{\lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a}, \lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{b}, \ldots, \lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a} \bigoplus \text{b}, \ldots, \lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a} \bigoplus \text{b} \bigoplus \text{c}\}$

Toy example

- Events can often be divided into subevents for cumulative themes:
  ‘That student_1 read three books’ entails that ‘That student_1 read two books’
  ‘Those students_{1+2} read three books’ does not entail ‘That student_1 read two books’

Toy example

There are two students, s_1 and s_2, and three books: a, b, and c.
Events are e with a superscript indicating the books read and a subscript indicating the students involved.
e_1^a would be an event of s_1 reading book a.
'+' between events indicates a sum of two subevents.

	Possible compatible events
That student read one book.	e_1^a, e_1^b, e_1^c
That student read two books.	e_1^{ab}, e_1^{bc}, e_1^{ac}
Each student read two books.	$e_1^{ab} + e_2^{bc}$, $e_1^{ab} + e_2^{ac}$, $e_1^{bc} + e_2^{ac}$, ...
Each student read books.	$e_1^{abc} + e_2^{bc}$, $e_1^a + e_2^{ac}$, $e_1^{bc} + e_2^{ac}$, ...

Toy example

- Assume that e_1^{ab} is equivalent to $e_1^a + e_1^b$ (other event properties being the same)
- Then, in a situation where s_1 read book a and b, $\lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a}$ would map e_1^a to true, e_1^{ab} would map $\lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a} \bigoplus \text{b}$ to true and $e_1^a \leq e_1^{ab}$ would be true. Thus, $\lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a} \leq \lambda e.\text{read}(e) \wedge \text{theme}(e) = \text{a} \bigoplus \text{b}$ would be true.
- This would rule out the VP denotation in (12) as an acceptable predicate for a Shan distributive since it would fail Card.
- The bare noun version of (1) ‘Each man read books’ works in English since the determiner distributive does not use Card.

Proposal summary

- Modeling indefinite expressions as alternatives allows distributive quantifiers in subject position to restrict semantic features of objects in their scope
- This capitalizes on Shan's use of the indeterminate pronoun to express distributivity
- This account makes use of a model of parthood between alternative functions
- The cardinal restriction for adnominal distributives can be framed as 'being defined by some quantity'—formally as not being both cumulative and divisive. This can be applied to adnominal cases in English locally and more distantly in the Shan case

Discussion

- This data and account adds to a cross-linguistic account of distributivity and the interpretation of indefinite expressions that needs to be explored further.
- The morphosyntactic source of distributivity can affect other features of distributivity. For example, share-marking distributives require a quantity expression and are non-maximal
- Further work is necessary to determine the constraints on distance between the distributive morpheme and the distributive share amount.
- A similar, non-local requirement for a degree expression might be seen with *per*:

(13) Per person, the trip costs $3000.

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References

Coppock, Elizabeth. 2026. Unifying dependent and independent numeral reduplication in newar. In *Proceedings of SULA-TripleA*.

Haslinger, Nina, Alain Noindonmon Hien, Emil Eva Rosina, Viola Schmitt, and Valerie Wurm. 2025. A unified semantics for distributive and non-distributive universal quantifiers across languages. *Natural Language & Linguistic Theory* 43:3147–3214.

Henderson, Robert. 2014. Dependent indefinites and their post-suppositions. *Semantics and Pragmatics* 7:1–58.

Jenks, Peter. 2011. The hidden structure of Thai noun phrases. Doctoral dissertation, Harvard University, Cambridge, MA.

Kratzer, Angelika, and Junko Shimoyama. 2017. Indeterminate Pronouns: The View from Japanese. In *Contrastiveness in Information Structure, Alternatives and Scalar Implicatures*, ed. by Chungmin Lee, Ferenc Kiefer, and Manfred Krifka, Studies in Natural Language and Linguistic Theory, 123–143. Cham: Springer International Publishing.

Krifka, Manfred. 1989. Nominal reference, temporal constitution and quantification in event semantics. *Semantics and contextual expression* 75:115.

Kuhn, Jeremy. 2017. Dependent indefinites: The view from sign language. *Journal of Semantics* 34:407–446.

Law, Jess HK. 2022. The mereological structure of distributivity: A case study of binominal each. *Journal of Semantics* 39:159–211.

Moroney, Mary. 2025. Question word distributivity. In *Sinn Und Bedeutung (SuB)*, ed. by Federica Longo and Daniele Panizza, volume 29, 1054–1070.

Moroney, Mary. 2026. *Unifying distributivity: A cross-linguistic account.* Talk at LSA 2026.

Safir, Ken, and Tim Stowell. 1988. Binominal each. In *Proceedings of NELS*, volume 18, 426–450. GLSA Amherst, MA.

Zimmermann, Malte. 2002. Boys buying two sausages each: On the syntax and semantics of distance-distributivity. Doctoral dissertation, University of Amsterdam, Amsterdam, Netherlands.

Dynamic account

Alternative accounts: Dynamic Account

Coppock 2026, Kuhn 2017, Henderson 2014

(14) Lexical entry for reduplicated numerals (Coppock 2026)

$[n\text{-}n^y_x\ \phi][\psi] \rightsquigarrow$

$[y] \wedge \phi(y) \wedge n(y) \wedge y > 1$

$\wedge\ \mathrm{one}(x) \wedge \mathrm{max}(x)$

$\wedge\ \psi$

(5) **lukhén [sǎam kɔ̂ɔ] lǎj laj pâaplik *(sɔ̌ɔŋ pâap)**
student three CLF.H DIST get book two CLF.BOOK
'Every three students get two books.' DETERMINER

(15) $[x] \wedge \mathit{student}(x) \wedge \mathit{three}(x) \wedge x \leq z \wedge \mathit{max}(x) \wedge \mathrm{Part}(x)$

$\wedge [y] \wedge \mathit{book}(y) \wedge \mathit{two}(y) \wedge \mathit{buy}(z, y) \wedge \overline{y > 1} \wedge \mathrm{Card}(y)$

Adnominal dynamic account

(4) lukhén laj [pâplik [[sǎam khɔ̂n **lǎj**] *(sɔ̌ɔŋ pâp)]]
student get book three CLF.HUM DIST two CLF.B(OOK)
'The students gets two books for every three students.'

ADNOMINAL

$$[z] \wedge student(z) \wedge [x] \wedge three(x) \wedge x \leq z \wedge$$
$$max(x) \wedge \mathrm{Part}(x) \wedge [y'] \wedge buy(z, y') \wedge$$
$$[y] \wedge y \leq y' \wedge R(y, x) \wedge book(y) \wedge two(y) \wedge \overline{y > 1} \wedge \mathrm{Card}(y)$$

Maximization

(16) $[\![max^x(\phi)]\!]^{\langle G,H\rangle} = \mathbb{T}$ iff $[\![[x] \wedge \phi]\!]^{\langle G,H\rangle} = \mathbb{T}$ and
There is no H' such that $H(x) \subsetneq H(x)$ and
$[\![[x] \wedge \phi]\!]^{\langle G,H\rangle} = \mathbb{T}$ (Henderson, 2014)

(17) Definition: Maximization Coppock 2026
$\langle G, H\rangle \vDash max(x)$ iff
- $H(x) \subseteq G(x)$, and
- there is no H' with $H'(x) \subseteq G(x)$ and $H(x) \subsetneq H'(x)$,
  where $H(x) = \{h(x) \colon h \in H\}$

(18) $\mathbf{max}_i(\phi) \coloneqq \lambda GH.([i] \wedge \phi)(G)(H)\& \neq$
$\exists H'.H(i)H'(i)\&([i] \wedge \phi)(G)(H')$ (Kuhn, 2017)

Dynamic Part and Card

Part and **Card** are still necessary implement the Shan distributive

(19) **Part**: Non-overlap $\langle G, H \rangle \vDash \textbf{Part}(x)$ iff

$\cdot H(x) \subseteq G(x)$, and

$\cdot \forall x', y \in H(x)[x' \neq y \rightarrow \neg\exists z[z \leq x' \wedge z \leq y]]$, where

$H(x) = \{h(x) \colon h \in H\}$

(20) **Card**: $\langle G, H \rangle \vDash \textbf{Card}(x)$ iff

$\cdot H(x) \subseteq G(x)$, and

$\cdot \exists z, x' \in H(x)[z \leq x'] \rightarrow$

$\exists y \in H(x), \exists z'[z' \leq y \wedge \neg z' \notin H(x)]$, where

$H(x) = \{h(x) \colon h \in H\}$

Dynamic implementation

It is possible to use a dynamic account for distributivity, but a compositional account is challenging

Part and Card are still needed