Unifying Dependent and Independent Numeral Reduplication in Newar

Elizabeth Coppock · Boston University

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Outline

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Proverb on specialization

From a collection of Newar proverbs:

(1) **खिं नं थःके पोंगा: नं थःके**
भावार्थ: फुक्कं थःगु कब्जाय् लाकेत स्वइम्ह धाय्कथं ।
छ्यला: खिं नं थःके पोंगा: नं थःके याना: ज्या बांलाइ मखु ।
सकसितं छगू छगू याना: ज्या इना बियादिसँ ।

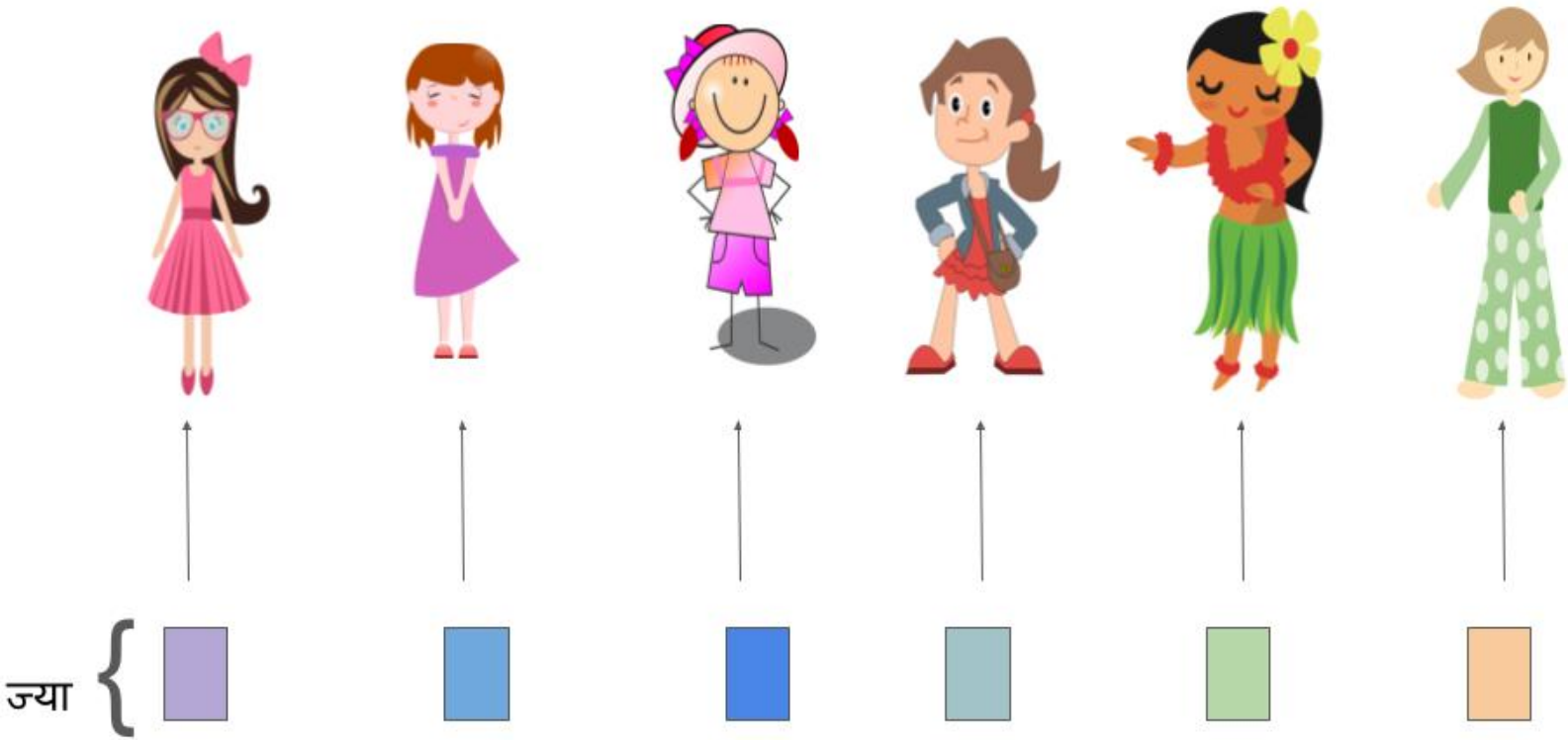
In the first line, पोंगा: 'khin' = drum; पोंगा: 'punga' is a traditional trumpet-like instrument. The first line says: playing both at the same time is not possible.

In general, the proverb says that it's not good to do two things at the same time; better to share the work to each different person. It's a pro-specialization proverb.

Proverb on specialization

(2) सकसितं छगू छगू (यानाः) ज्या इना बियादिसँ ।
saka-sitaṃ chagū chagū (yānāḥ) jyā inā biyādisaM .
every-to 1-clf 1-clf (by) work share / distribute
'Distribute one job to each person'

Verifying scenario



Literal scenario

Can reduplicated numeral attach to noun?

Evidence for yes: reduplicated numerals can follow the noun, just like ordinary numerals:

(3) सकसितं ज्या निगू निगू इना बियादिसँ ।
sakasitaṃ jyā nigū nigū ināṃ biyādisaṃ .
everyone work 2 2 share give

They cannot be postposed:

(4) *सकसितं ज्या इना बियादिसँ निगू निगू ।
sakasitaṃ jyā ināṃ biyādisaṃ nigū nigū .
everyone work share give 2 2

Reduplicated ‘two’ with an animate

(Cable, 2014)

(5) फुक्क मिसामस्तय्सं निम्ह निम्ह खिचातय्त म्व:ल्हुकल ।
phukka misāmas-ta-ysaṃ ni-mha ni-mha khicā-ta-yta mva:lhukala .
every girl-pl-erg 2-clf 2-clf dog-pl-to bathed

Reduplicated ‘one’ with an animate

(Cable, 2014)

(6) फुक्क मिसामस्तय्सं छम्ह छम्ह खिचायात म्व:ल्हुकल ।
phukka misāmas-ta-ysaṃ cha-mha cha-mha khicā-yāta mva:lhukala .
every girl-pl-erg 1-clf 1-clf dog-to bathed
‘Every girl bathed one dog each.’

Outline

Copying every book

(7) यक्व-यक्व सफू च्वय्मा:गु व छपं-छपं सफू
yakva-yakva saphū cvaymā:gu va chapaṃ-chapaṃ saphū
much-much book hand-writing and one.CLF-I.CLF book
ल्ह्यय्त अप्वः ई काइगु
lhyayta apvaḥ ī kāigu
copy-inf much time take

Writing each truth

(8) च्वमिं छगू छगू सत्य खँ च्वइ ।
cvamiṃ cha-gū cha-gū satya khaM cvi .
writer 1-clf 1-clf true matter write
'The writer will write each truth.'

Writing each letter

(9) दकले न्हापां छगः छगः आखः च्वयेगु ।
dakale nhāpāṃ cha-gaḥ cha-gaḥ ākhaḥ cvayegu .
first of all 1-clf 1-clf letter write
'First, write each letter.'

Every letter is correct

(10) छगः छगः आखः मिले-जु ।
cha-gaḥ cha-gaḥ ākhaḥ mile-ju .
1-clf 1-clf letter good-be
'Each letter is correct.'

Speaker comment: "Yes, that's possible. More particularly going."

Here is a case where 'one' cannot be replaced by 'two':

(11) *निगः निगः आखः मिले-जु ।
ni-gaḥ ni-gaḥ ākhaḥ mile-ju .
2-clf 2-clf letter good-be

Reduplicated ‘one’ meaning ‘every’

(3) Angolar (Maurer 2013a)

Ka	*pê*	*taya*	*kôôndja*	*lêtu*	*fia*	*e*	*ki*	*ũa*	*ũa*	*taminha*	*e.*
PST	put	slice	coconut	inside	leaf	DEM	with	one	one	bowl	DEM

‘They put slices of coconut in the [banana] leaves, [which were at the bottom of] every bowl.’

(9) Tok Pisin (Smith & Siegel 2013)

Tripela	*taim*	*long*	*wanpela*	*wanpela*	*yia*	*yupela*	*mas*	*makim*	*bikpela*	*de*	*bilong*	*lotu*	*bilong*	*mi.*
three	time	in	one	one	year	2PL	must	mark	big	day	for	worship	POSS	1SG

‘Three times each year you must reserve a feast day for worship.’

(12) Sango (Samarin 2013)

na	*ya*	*ti*	*abar*	*oko*	*oko*
LOC	belly	of	PL.bar	one	one

‘in each one of the bars (site for drinking).’

See example 59-124

Gil's conjecture

Gil's conjecture: Distributivity markers that are reduplicated (numerals or nouns) always mark the share in a distributive relation.

X-woo-X constructions in Mandinka manifest another apparent violation of Gil's conjecture (Cisse & Coppock, 2023):

(12) Musu-woo-musu ye kini taboo noo le
woman-DIST-woman PRED rice cooking know PERF
'Each woman knows how to cook rice.'

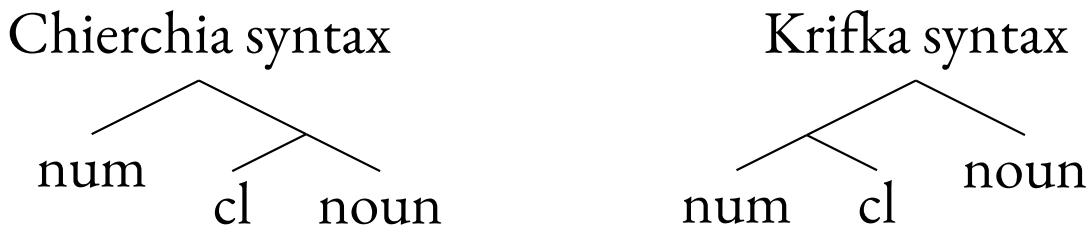
Cisse & Coppock (2023) argue for an analysis in terms of 'simultaneous distributivity', where reduplication simultaneously marks the share and the key, also observed in French Sign Language (Kuhn & Aristodemo, 2017) and Comox-Sliammon (Henderson, 2019).

Summary

- In some cases, *cha* ‘one’ can be replaced by *ni* ‘two’.
- In other cases, not.
  - In these cases, the interpretation is universal with respect to the noun associated with the reduplicated numeral.

Outline

Classifier syntax issue



(Chierchia, 1998; Krifka, 1989; Bale et al., 2019; Dékány, 2024)

Argument #1 for Krifka syntax: Morphology

Morphologically, the classifier is a suffix on the numeral. Evidence:

- Orthography (no space)
- Many words are listed in dictionaries with classifier suffixes
- Indigenous pedagogical materials present the suffixed forms as words
- There are irregular forms

घौ (ghau) 'hour'	छघौ, निघौ, स्वघौ, ...	(chaghau, nighau, svaghau, ...)
न्हु (nhu) 'day'	छन्हु, निन्हु, स्वन्हु, ...	(chanhu, ninhu, svanhu, ...)
ला (lā) 'month'	लाछि, निला, स्वला, ...	(lāchi, nilā, svalā, ...)
दँ (daṁ) 'year'	दँछि, निदँ, स्वदँ, ...	(daṁchi, nidaṁ, svadaṁ, ...)

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Argument #2 for Krifka syntax (Background)

For Chol, Bale et al. (2019) advocate Krifka-syntax ([NUM CLF] NOUN) on the grounds that numeral+classifier constituents can be coordinated:

(13) cha'-tyikil ux-tyikil kixtyañu (Chol)
two-CLF three-CLF person
'few people'

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Dékány's (2024) rebuttal: This proves nothing.
There could be Chierchia-syntax (NUM [CLF NOUN]) with ellipsis of *kixtyañu* 'person'.

Argument #2 for Krifka syntax: Reduplication

In Newar, reduplication of NUM+CLF makes a similar argument:

(15)

जि	काय्पिसं	स्वम्ह	स्वम्ह	न्या	लात	।
ji	kāypisaṃ	svamha	svamha	nyā	lāta	.
1sg	son-pl-erg	3-clf	3-clf	fish	caught	

Argument #2 for Krifka syntax: Reduplication

In Newar, reduplication of NUM+CLF makes a similar argument:

(17) जि काय्पिसं स्वम्ह स्वम्ह न्या लात ।
ji kāypisaṃ svamha svamha nyā lāta .
1sg son-pl-erg 3-clf 3-clf fish caught

Chierchia-syntax would require ellipsis with no overt counterpart:

(18) *जि काय्पिसं स्वम्ह न्या स्वम्ह न्या लात ।
ji kāypisaṃ svamha nyā svamha nyā lāta
1sg son-pl-erg 3-clf fish 3-clf fish caught

Argument #2 for Krifka syntax: Reduplication

In Newar, reduplication of NUM+CLF makes a similar argument:

(19) जि काय्पिसं स्वम्ह स्वम्ह न्या लात ।
ji kāypisaṃ svamha svamha nyā lāta .
1sg son-pl-erg 3-clf 3-clf fish caught

Chierchia-syntax would require ellipsis with no overt counterpart:

(20) *जि काय्पिसं स्वम्ह न्या स्वम्ह न्या लात ।
ji kāypisaṃ svamha nyā svamha nyā lāta
1sg son-pl-erg 3-clf fish 3-clf fish caught

No Dékany-style rebuttal available here.

Outline

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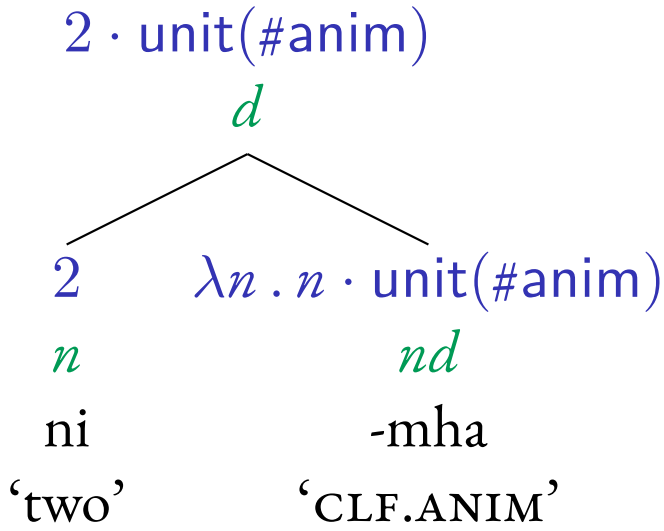
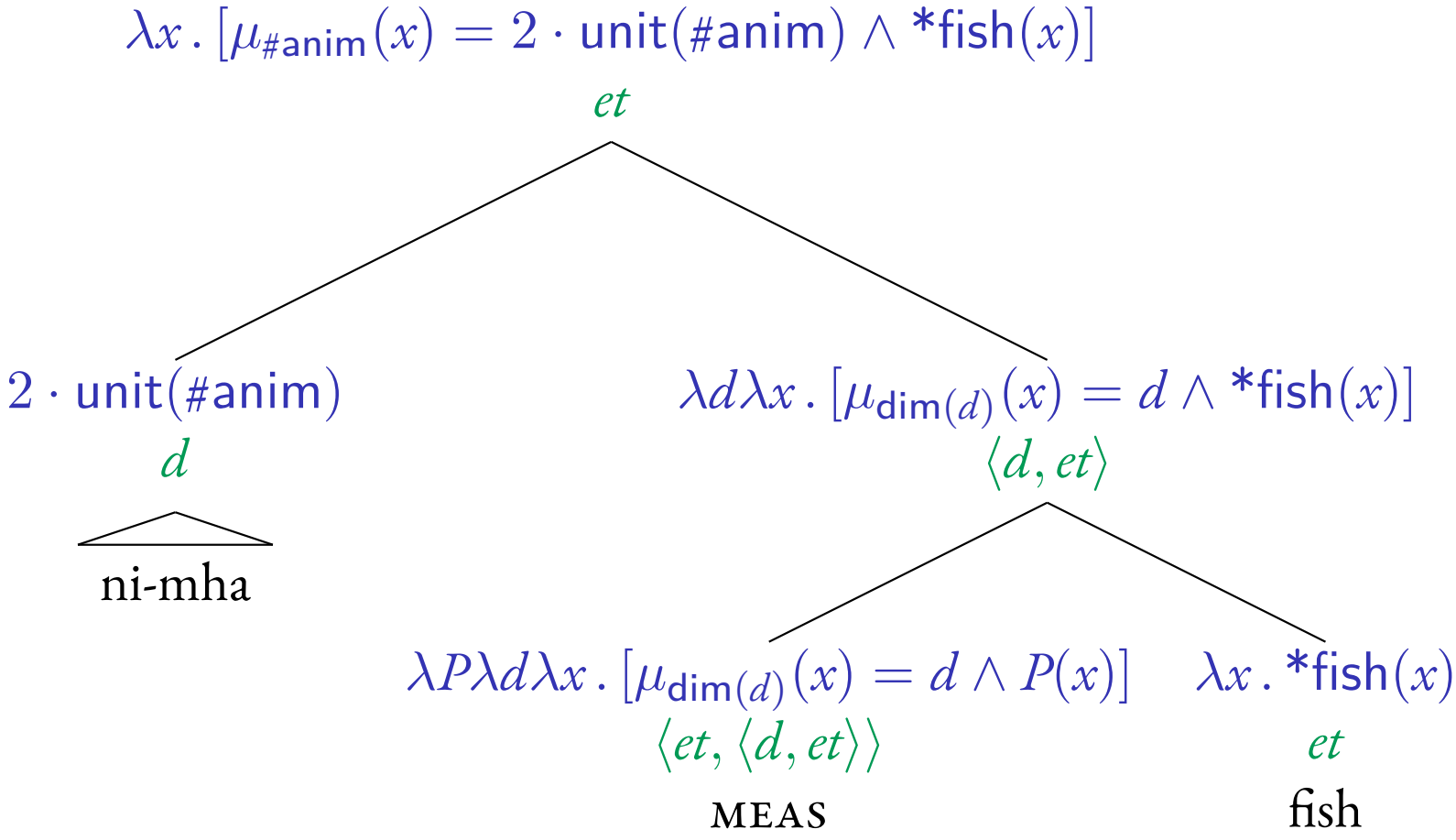
Structure of a classifier-affixed numeral



where, following Coppock (2022):

- $\mathsf{unit}(D)$ is the ‘unit quantity’ for dimension D
- $\#\mathsf{anim}$ is the ‘cardinality dimension’ counting animate beings

Structure of 'two fish'



where, following Coppock (2022),

- μ_D is the 'canonical measure' for dimension D, and
- $\mathsf{dim}(d)$ is the dimension for degree d

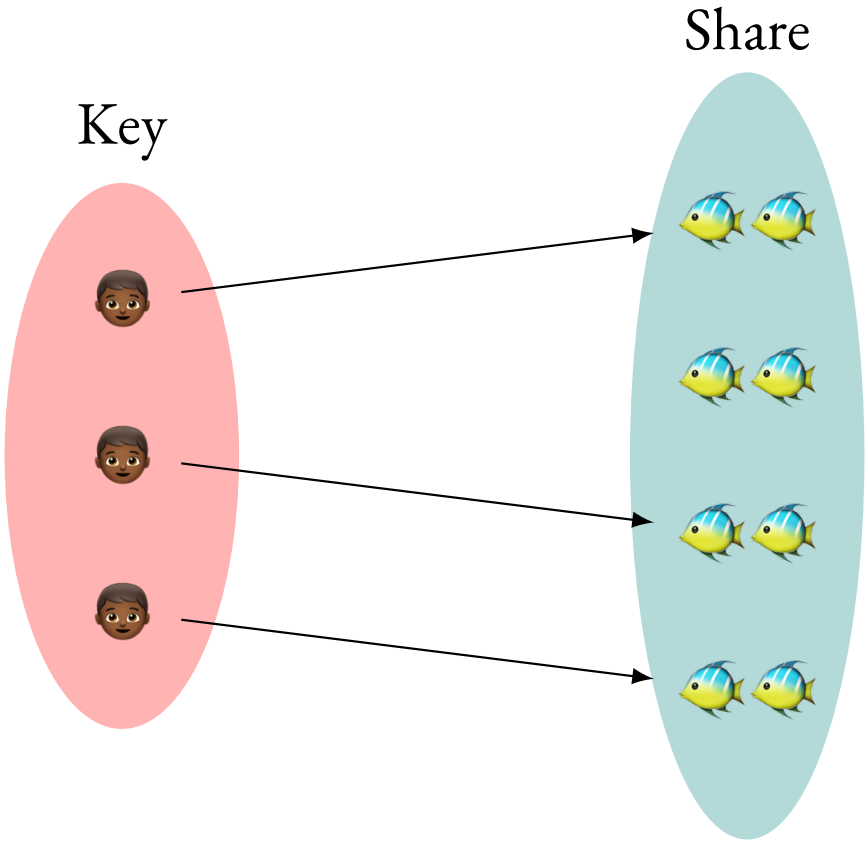
Outline

Next up: reduplication

Now let us build up truth conditions for reduplicated numerals, as in:

(21) जि काय्पिसं निम्ह निम्ह न्या लात ।
ji kāypisaṃ nimha nimha nyā lāta .
1sg son-pl-erg 2-clf 2-clf fish caught
'My sons caught two fish each.'

Distributive relation



Points of comparison: Some other share-markers

- Korean *-ssik* (Choe, 1987)
- Reduplicated numerals in Hungarian (Farkas, 1997)
- Reduplicated numerals in Telugu (Balusu, 2006)
- Reduplicated numerals in Kaqchikel (Henderson, 2014)
- Distributive numerals in Tlingit (Cable, 2014)
- Binominal *each*, as in *one balloon each* (Safir & Stowell, 1988; Choe, 1987; Champollion, 2016)

Reduplicated numerals in Hungarian

(22) Minden gyerek olvasott egy-egy / hét-hét könyvet.
every child read.PAST 1-1 / 7-7 book-ACC
'Each child read one/seven books.' (Farkas, 1997)

Farkas observes that "they must have non-rigid reference"; "the indefinite must be within the scope of the universal."

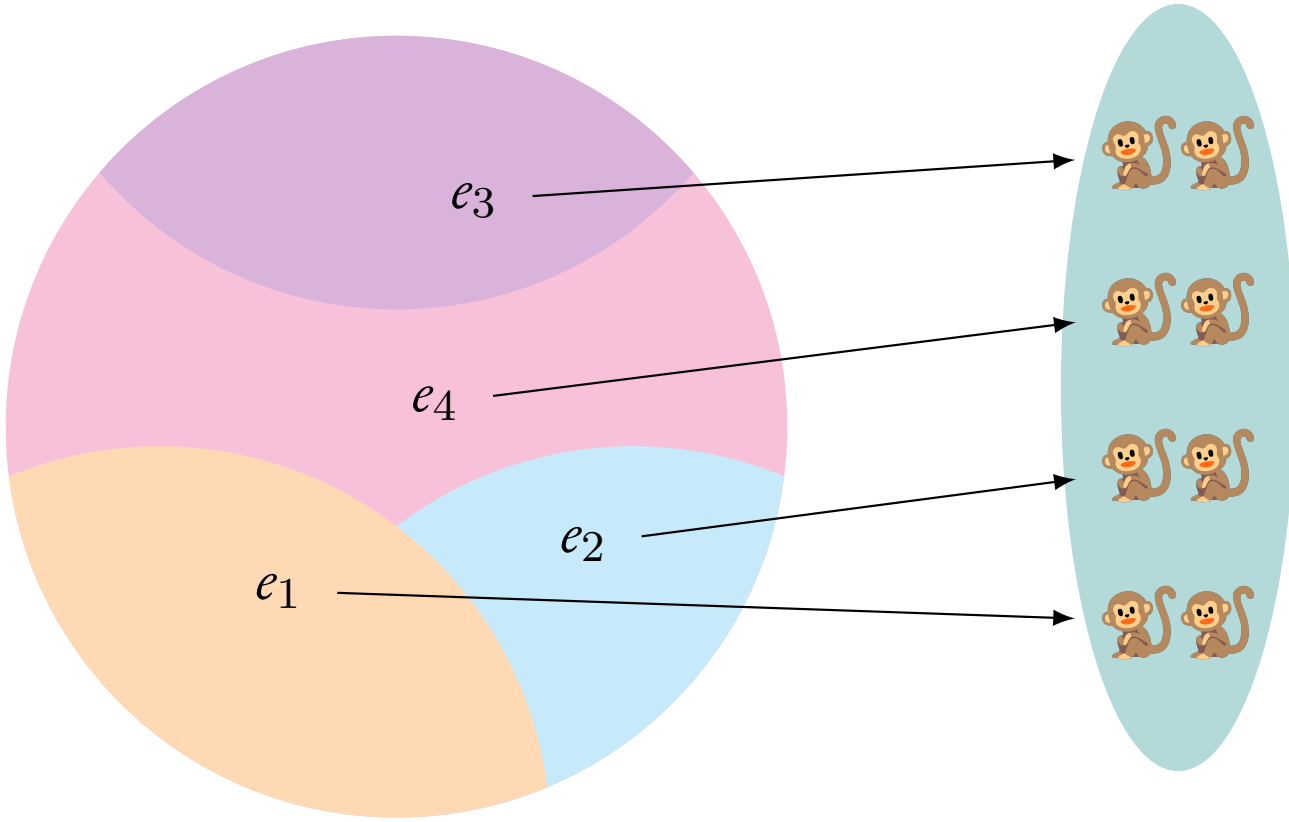
Hence the term **dependent indefinites**; cf. Brasoveanu & Farkas (2011).

Reduplicated numerals in Telugu

(23) ii pilla-lu renDu renDu kootu-lu-ni cuus-ee-ru
these kid-PL 2 2 monkey-PL-ACC see-PAST-3PL
'These kids...
... each saw 2 monkeys.' Participant key
... saw 2 monkeys each time.' Temporal key
... saw 2 monkeys in each location.' Spatial key

(Balusu, 2006)

Balusu's insight: Divide up the event



$$\pi(e) = \{e_1, e_2, e_3, e_4\}$$

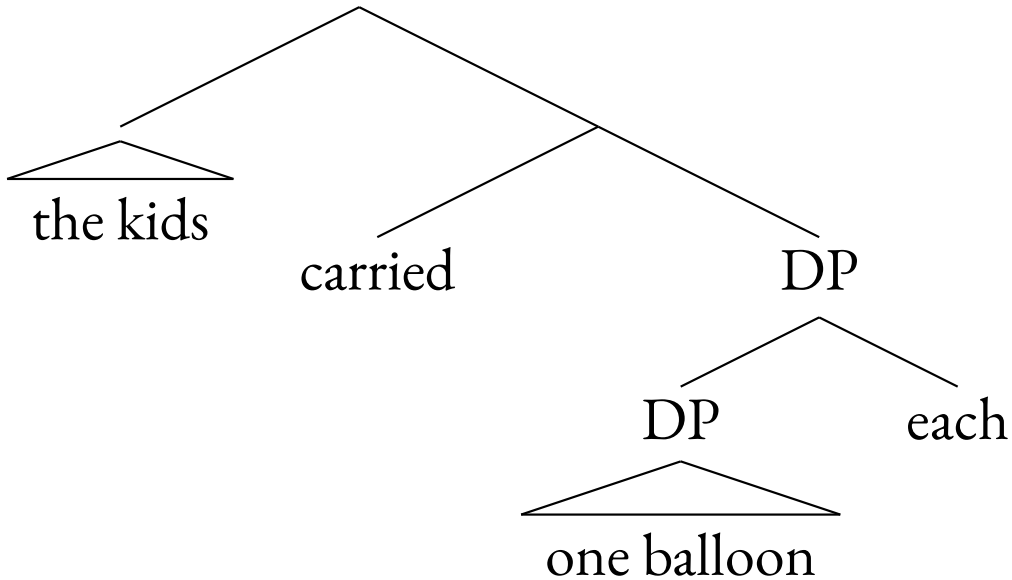
Compositional strategy

How to get the share-marker to communicate with the key?

Idea from Champollion (2016): The share-marker is parameterized by a non-local thematic role that identifies the key.

Will illustrate with binominal *each*.

Structure of binominal *each*

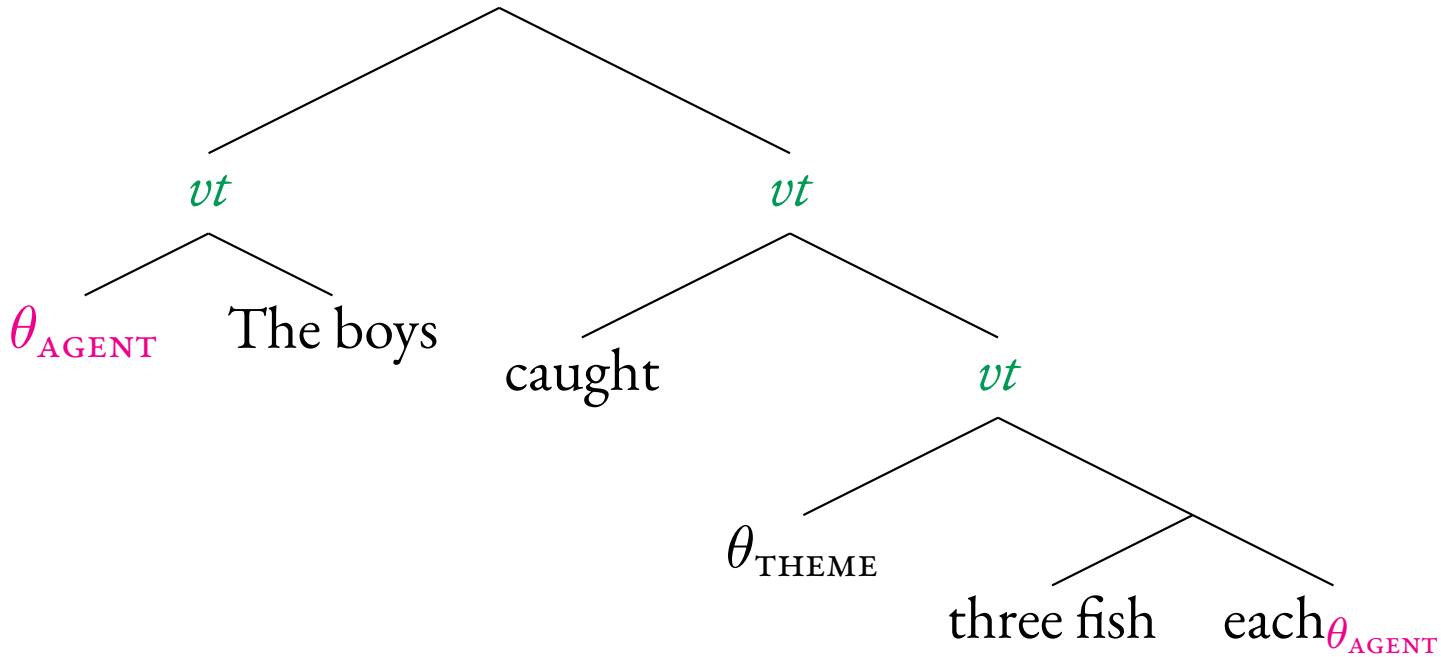


Evidence (Safir & Stowell, 1988):

- **The kids decided to leave each*
- *One balloon each was carried by the kids*

Champollion's analysis of *each*

Each is 'coindexed' with the thematic role for the key, and combines locally with the thematic role for the share.



$$\textit{each} \rightsquigarrow \lambda\theta_{\text{KEY}}\lambda P\lambda\theta_{\text{SHARE}}\lambda e\,.\,e \in {}^{*}\lambda e'\,.\,[P(\theta_{\text{SHARE}}(e')) \wedge \mathsf{atom}(\theta_{\text{KEY}}(e')]$$

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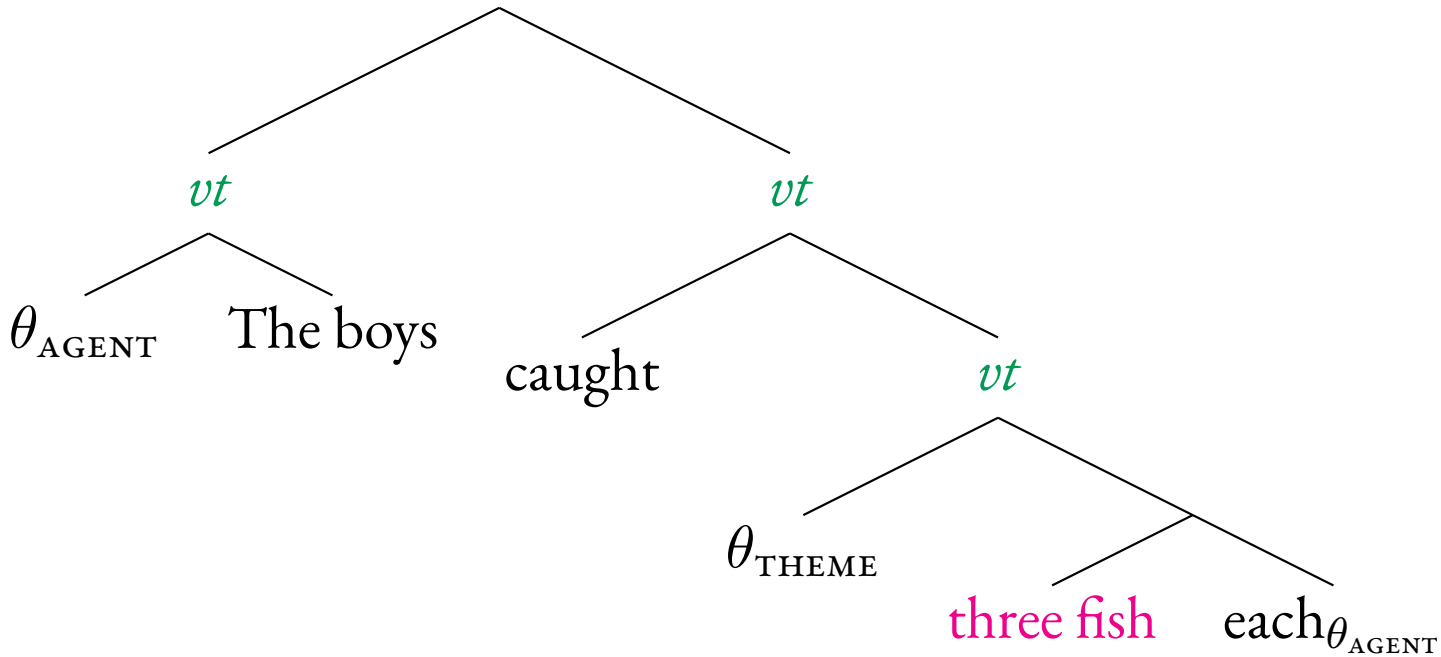

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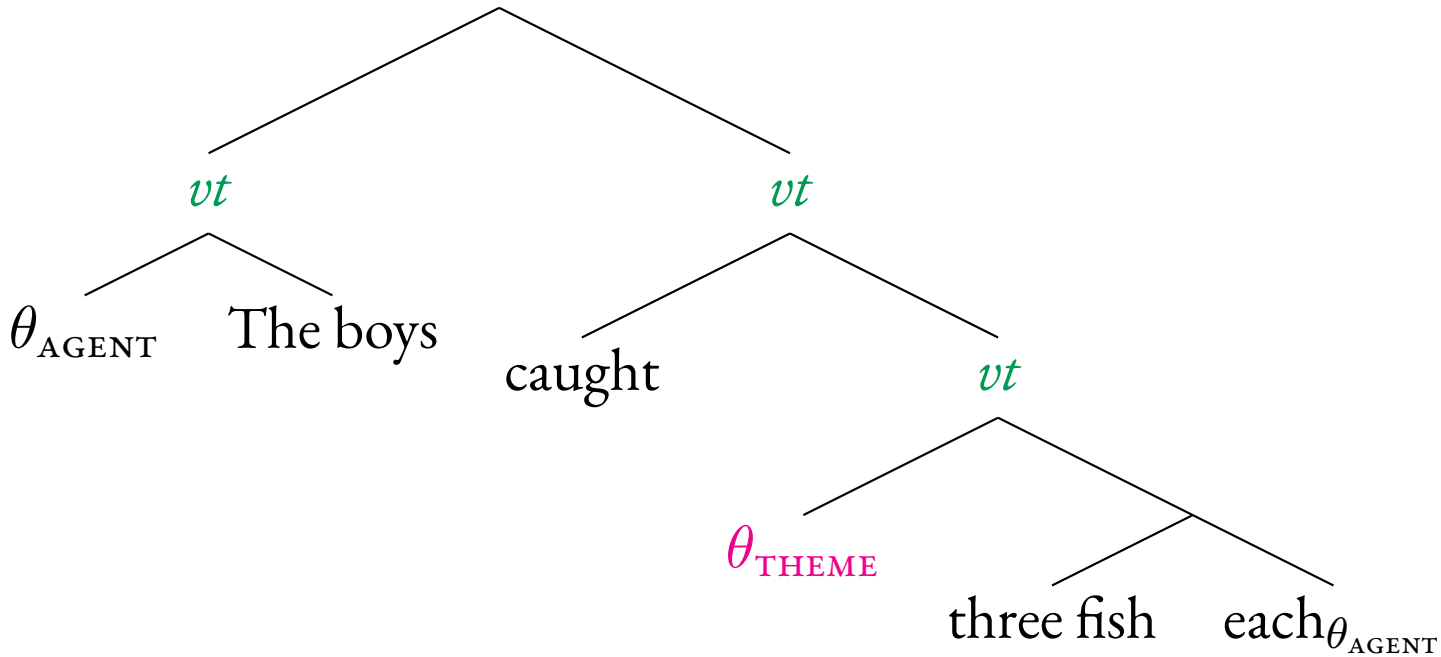

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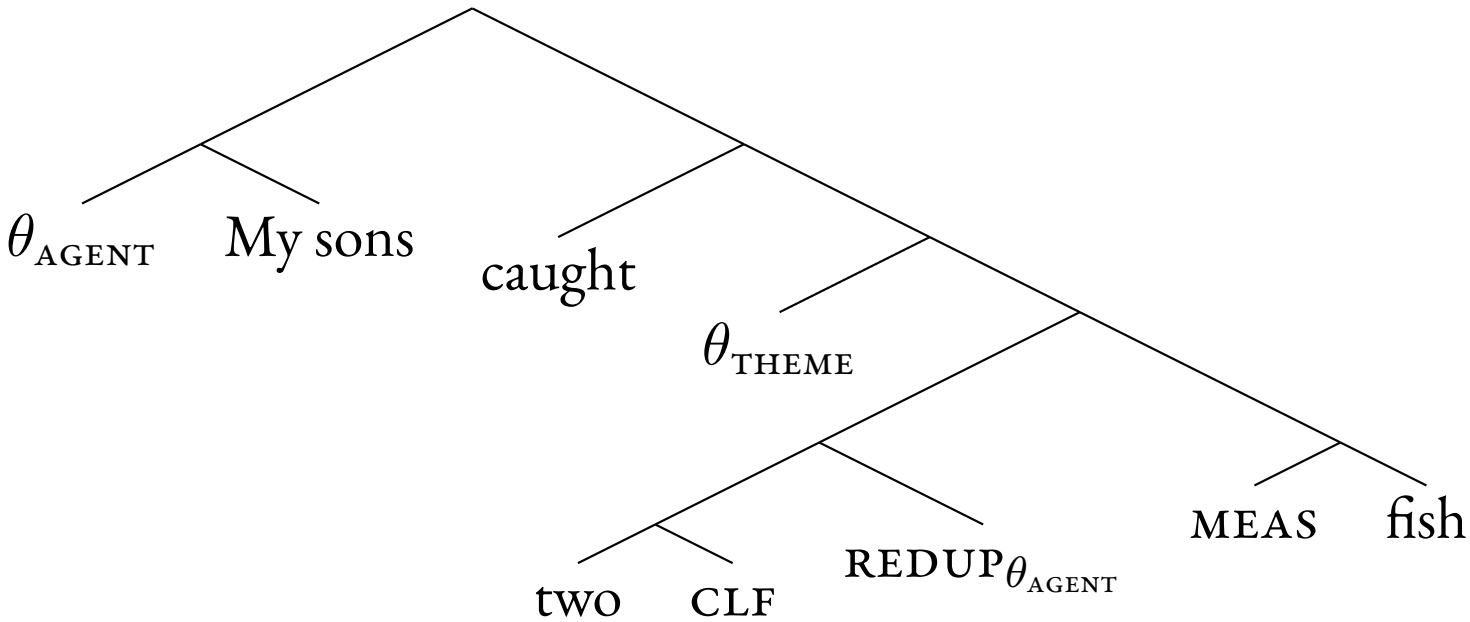
LF for dependent use of reduplicated numeral

(24) जि काय्पिसं निम्ह निम्ह न्या लात ।
ji kāypisaṃ nimha nimha nyā lāta .
1sg son-pl-erg 2-clf 2-clf fish caught
'My sons caught two fish each.'



What about independent readings?

Here the reduplicated numeral is neither dependent nor an indefinite:

(25) छगः छगः आखः मिले-जु ।
cha-gaḥ cha-gaḥ ākhaḥ mile-ju .
1-clf 1-clf letter good-be
'Each letter is correct.'

Questions:

- How to allow for these uses?
- How to derive universal readings?
- How to rule out higher numerals?

My proposal: Two key ideas

My proposal for how to unify dependent and independent readings involves two key ideas:

1. The semantics is given in terms of sequences, which must continue as long as possible.
2. The local (Θ) and non-local (θ) thematic roles can be identical.

Key idea #1: Sequences

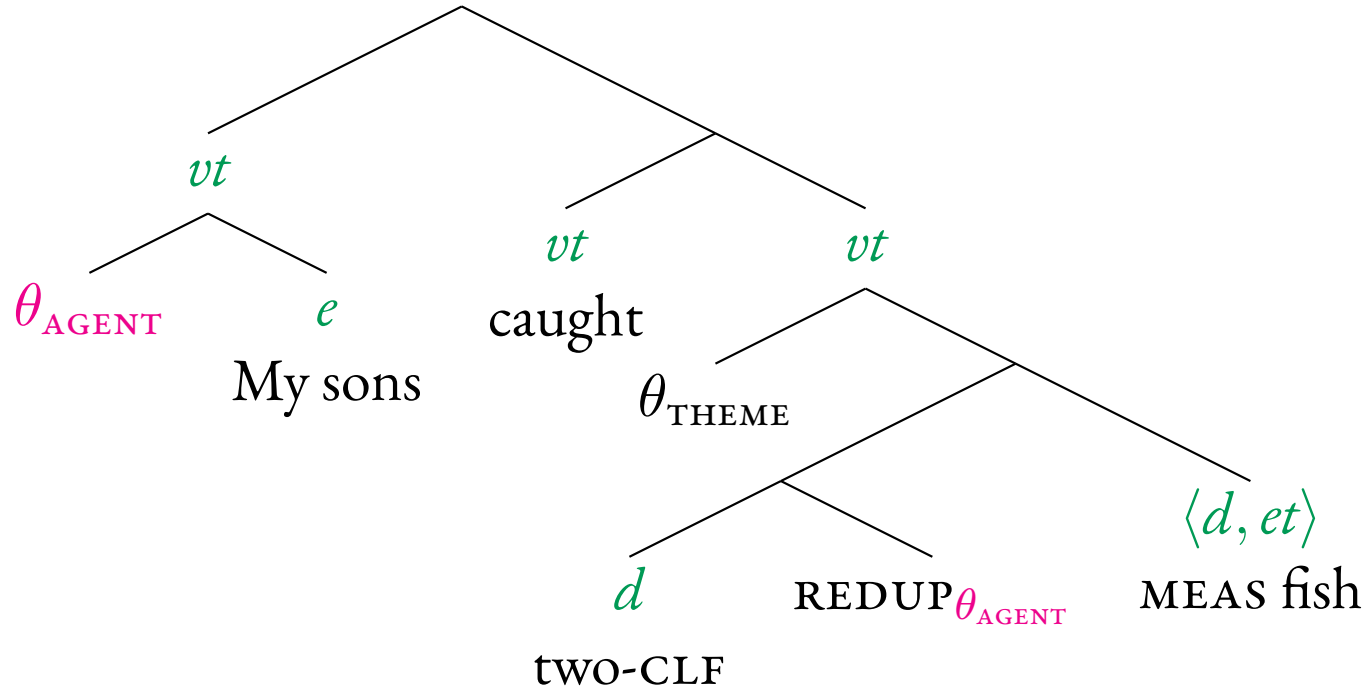
$$\textsc{redup} \rightsquigarrow \lambda\theta_{\textsc{key}}\lambda d\lambda G\lambda\theta_{\textsc{share}}\lambda e\,.\,\exists\vec{E} = \langle e_1, \ldots, e_n\rangle$$
$$[\ e = \vec{\bigoplus}(\vec{E})$$
$$\wedge\exists\vec{X} = \langle x_1, \ldots, x_n\rangle$$
$$[\theta_{\textsc{key}}(e) = \vec{\bigoplus}(\vec{X}) \wedge \partial(\forall i, j : x_i \neq x_j)$$
$$\wedge\forall i \in \{1, 2, \ldots, n\}$$
$$[G(\theta_{\textsc{share}}(e_i)) = d \wedge \theta_{\textsc{key}}(e_i) = x_i \wedge \mathsf{atom}(x_i)]]]$$

where

- $\vec{E}$ and $\vec{X}$ are variables over n-tuples
- $\vec{\bigoplus}$ takes the sum of all the elements in a vector
- n is a free parameter

Rule of inertia: Make n as high as possible without contradiction.

LF for dependent use



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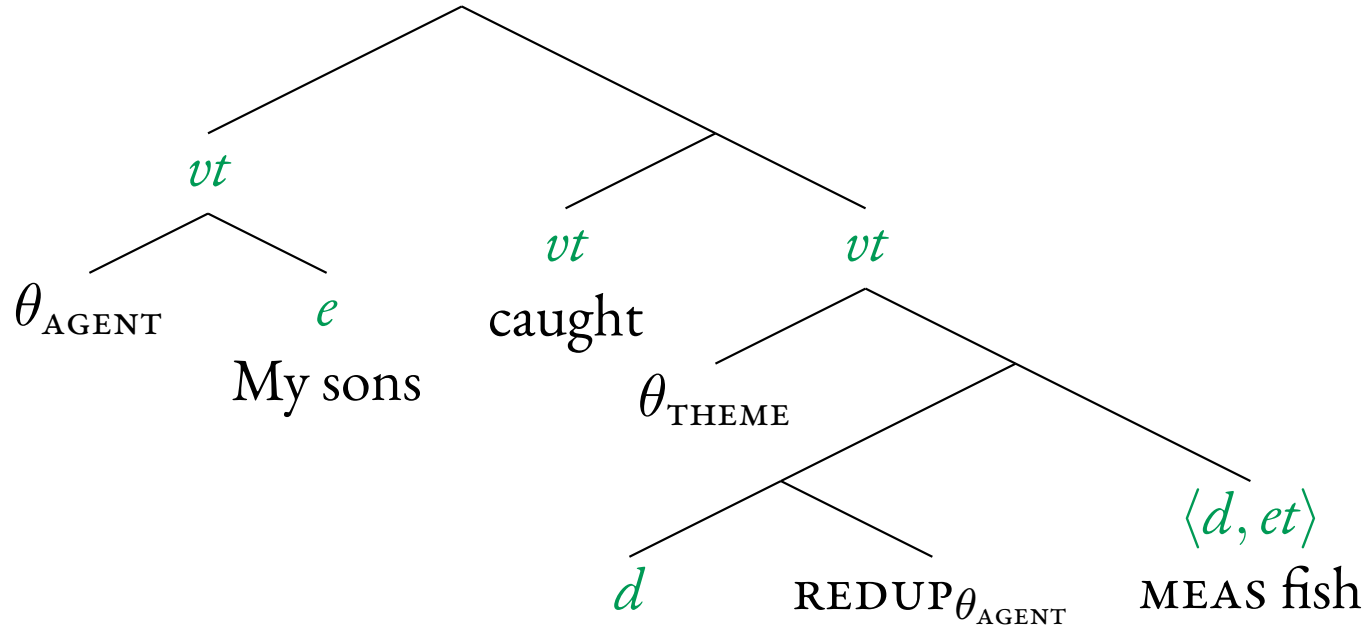

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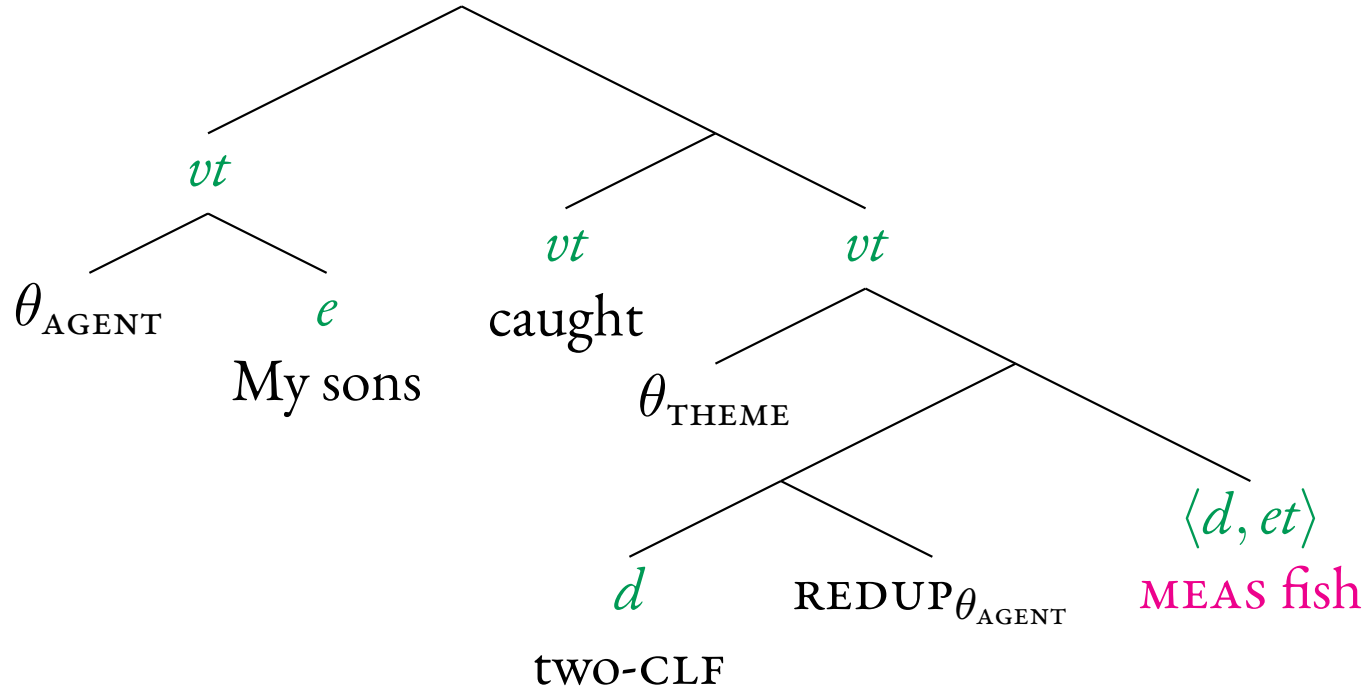

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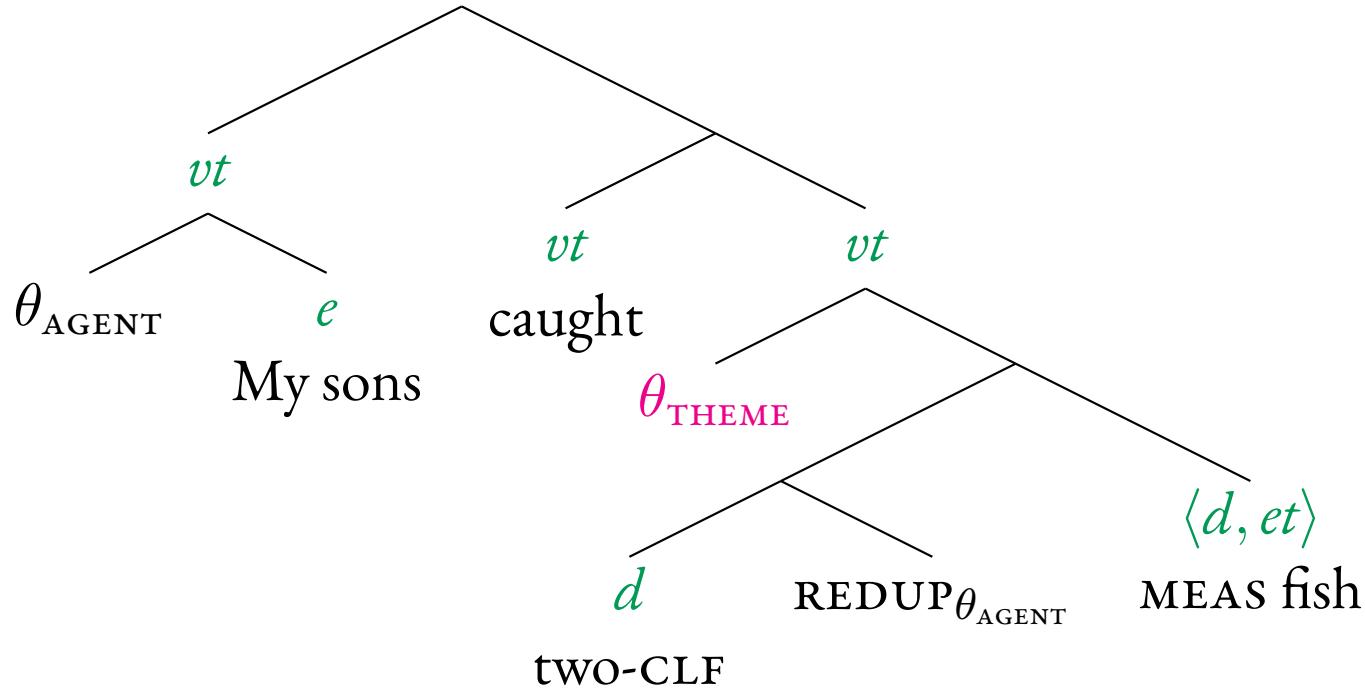

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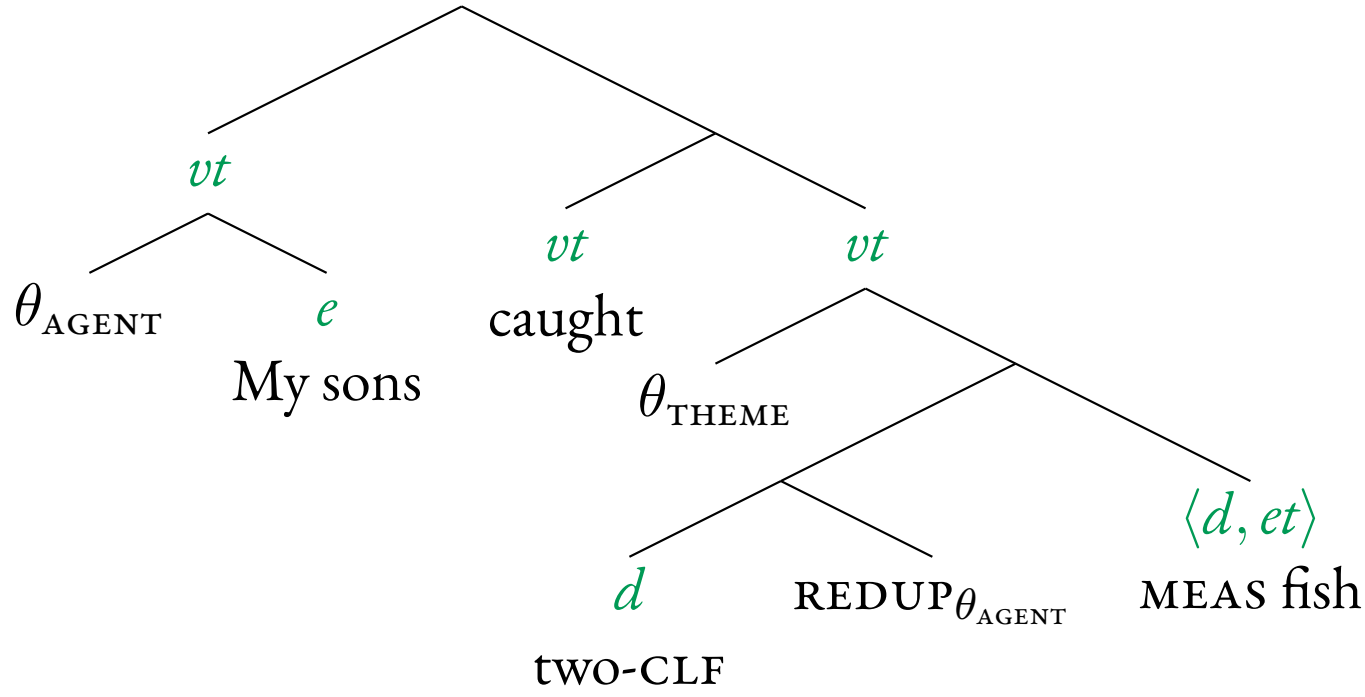
LF for dependent use



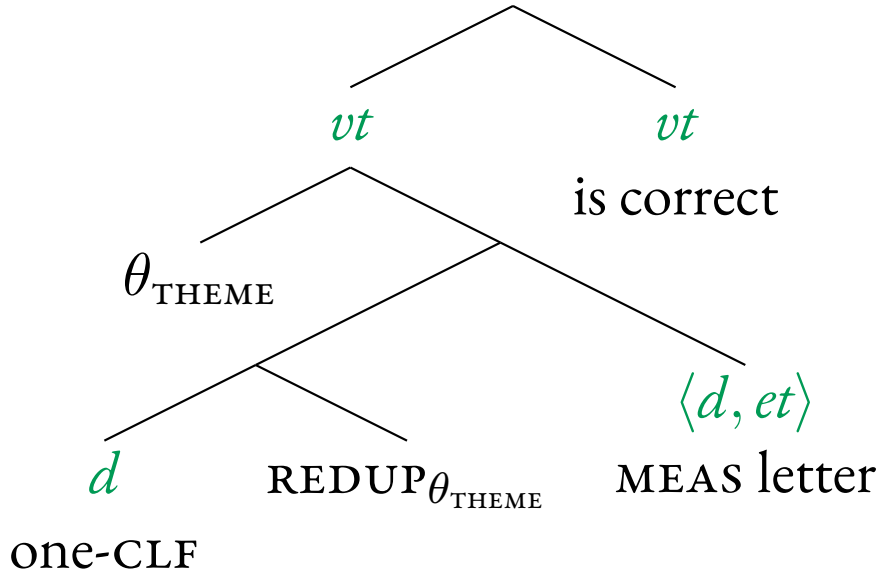
$\rightsquigarrow$

$\lambda e \,.\, e$ is a sum of catching events whose agent is 'my sons', composed of a sequence of events $\langle e_1, \ldots, e_n \rangle$ each of whose themes is a pair of fish, and there is a sequence of atomic individuals $\langle x_1, \ldots, x_n \rangle$ comprising the agents of each respective subevent.

Key idea #2: $\theta_{\text{KEY}} = \theta_{\text{SHARE}}$ is possible

The local (θ_{KEY}) and non-local (θ_{SHARE}) thematic roles can be identical.

LF for independent use



$\rightsquigarrow$

λe . e is a sum of being-correct eventualities composed of a sequence of eventualities $\langle e_1, \ldots, e_n \rangle$ each of whose themes is a single letter, and there is a sequence of atomic individuals $\langle x_1, \ldots, x_n \rangle$ comprising the themes of each respective subevent.

- The rule of inertia derives the universal reading.
- The atomicity constraint on the key derives the restriction against the use of higher numerals.

Final thoughts

- Reduplicated numerals in Newar have both dependent-indefinite and independent-universal uses.
- I have proposed a way of unifying them using sequences.
- This analysis offers a new lens on 'simultaneous distributivity'.
- An approach to the semantics of reduplication based on sequences aligns with the repetitive hand gestures that Newar speakers make when using these constructions.
- And it makes good on the compelling intuition that the semantics of reduplication is rooted iconically in the repetition of form.

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