

Anaphors & Distributive Reduplication

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(F)ASAL 11 UMN

Special session honouring Rahul Balusu

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Distributivity and reduplication

Background

- Many (most?) languages of South Asia employ reduplication to signal distributivity:

- (1) čappa čappa č^haan maro
patch patch search hit.IMP
'Search every corner!'

Hindi-Urdu

- (2) memu renḍu renḍu iḍli-lu tinnamu
we two two idli-PL ate
'We ate two two idlis'

Telugu

- This is common crosslinguistically:

- (3) Xeqatij ox-ox wäy.
we-eat three-three tortilla
'We each ate three tortillas.'

Kaqchikel Mayan (Henderson, 2014)

- (4) Minden rendezö benevezte két-két film-jét.
every director entered two-two film-POSS.3SG.ACC
'Every director entered two films of his (in the competition).'

Hungarian (Kuhn, 2017)

Our goals for this talk

- **Observation:** there is a parallel between distributive elements on the one hand, and reflexive and reciprocal constructions on the other. All these constructions involve reduplicated dependent elements (Balusu & Jayaseelan, 2013).
- **Today:** we show it is possible to give a unified analysis to account for the phenomena.
- **Proposal:** reflexives and reciprocals parallel distributive markers and markers of distributive numerals in signaling distributive quantification and imposing constraints on its outcome (Law, 2018).

Balusu (2006) on distributive reduplication

Background

- Balusu (2006) presents a thorough description and a compelling account of distributivity associated with reduplicated numeral modifiers:

(5) pilla-lu **renḁu renḁu** kootu-la-ni cuusææru
kid-PL two two monkey-PL-ACC saw
'The kids saw **two two** monkeys'

- (5) is three-ways ambiguous:
 - a. **Each kid** saw two monkeys
 - b. The kids saw two monkeys at **each location**
 - c. The kids saw two monkeys **each time**

Participant key
Spatial key
Temporal key

Balusu (2006): properties of reduplicated numerals

Background

- RedNums are **dependent** on a plurality: either participants, locations, or times
 - (6) Ravi saw two-two monkeys
 - a. Ravi saw two monkeys at each location Spatial key
 - b. Ravi saw two monkeys each time Temporal key
 - (7) The kids know two-two instruments Participant key
 - a. Each kid knows two instruments
 - (8) # Ravi saw two-two monkeys at 11:34 AM in the Parakeet enclosure
- The monkey-pair **needs to vary** with the seeing events
 - (9) The kids saw two-two monkeys
 - a. Adil → Ramu, Shamu
 - b. Jeet → Ramu, Shamu #

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a. Ravi saw two monkeys at each location

Spatial key

b. Ravi saw two monkeys each time

Temporal key

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a. Each kid knows two instruments

Participant key

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- The monkey-pair **needs to vary** with the seeing events

(9) The kids saw two-two monkeys

a. Adil → Ramu, Shamu

b. Jeet → Ramu, Shamu

#

c. Hoshang → Ramu, Kapish

✓

Balusu (2006): analysis & extensions

Background

(10) Generalizations

- a. D-operator: RedNum has a silent counterpart of binominal *each*.
- b. Anaphoricity: the D-operator takes an event or event-aspect as sorting key.
- c. Event structure: can be fine-grained (multiple temporal or spatial partitions) or coarse-grained (trivial partition).
- d. Variation: RedNum is associated with a plurality requirement.

- Formally, the distributivity arising from the RedNum is a universal quantifier over events, and the variation condition is a not-at-issue meaning that requires a certain cardinality.

(11) “two-two monkeys jumped”:

(Balusu, 2006, ex. 30)

a. $\exists e \exists \pi(e) [\forall e' \in \pi(e) \exists x [2.\text{monkeys}(x) \wedge \text{jumped}(x)]]$

b. $|\{x : 2.\text{monkeys}(x) \wedge \text{jumped}(x, e)\}| > 1$

variation requirement

Balusu & Jayaseelan (2013): analysis & extensions

Background

- Balusu & Jayaseelan (2013) extend this idea to the Malayalam possessive anaphor.
- *awar-awar* is also reduplicated and distributive.

(12) kutṭika! *awar-awar*-uṭe wiṭṭ-il-eḷḷa pooyi
children they-they-GEN house-LOC-DAT went
'The children went to their respective houses'

- Since this anaphor only takes a nominal as its antecedent, it only has the participant key reading.
- ☞ Today we extend this idea to Telugu local anaphors.
- Only local anaphors necessarily reduplicate¹.
 - Telugu has the equivalent of the possessive anaphor *awar-awar*, but we will not discuss these here.

¹There's some variation. Ask us about it during the Q&A.

Telugu reflexives and reciprocals

Overview

- Telugu has a single morpheme – traditionally glossed as VR (verbal reflexive) – which may express both reflexive and reciprocal readings.
- Three possible interpretations here:

(13) pillā-lu mečču-**kunn**-aaru
child-PL praise-VR-PST.3PL

Reflexive: 'The children praised themselves'

Reciprocal: 'The children praised each other'

Mixed: 'Some children praised themselves while some others praised each other'

- This construction may be further specified by means of a reduplicated element that gives it an unambiguously reciprocal or reflexive reading.
- The Algonquian language Cheyenne has an equivalent construction. See Murray (2007, 2008)

Telugu reciprocals

Overview

- Telugu reciprocal constructions involve a reduplicated indefinite (one.HUM):

(14) pilla-lu okari-ni okaru mečču-kunn-aaru
 child-PL one.HUM-ACC one.HUM praise-VR-PST.3PL
 ‘The kids praised each other’

- Reciprocals (and reflexives) are local anaphors (Jayaseelan 1996, Messick & Raghotham tomorrow):
 - They require a c-commanding local antecedent;
 - They cannot be used deictically;
 - They cannot have split antecedents.
- They differ from other anaphors in requiring distinctness of event participants.
- Crucially, the distinctness must obtain when the participant set is distributed over.

(15) * The committee is annoying each other.

(16) ? The committee are annoying each other.

Telugu reflexives

Overview

- Telugu reflexives involve a reduplicated element as well.
- The reduplicated element may be a simplex anaphor (17), or a pronominal (18).

(17) pilla-lu **tama-ni tamu** mečču-kunn-aaru
child-PL 3PL-ACC 3PL praise-VR-PST.3PL
'The kids praised themselves'

(18) pilla-lu **va||a-ni va||u** mečču-kunn-aaru
child-PL 3PL-ACC 3PL praise-VR-PST.3PL
'The kids praised themselves'

- Like reciprocals, reflexives distribute over the set of participants (at least on the most salient reading).

(19) The kids praised themselves.
 ~> Each kid praised herself.

- They differ from reciprocals in requiring that there be an overlap, if not identity, between two event participants.

RedNums vs. REC & RFLX anaphors

Similarities and distinctions

	RedNums	REC	RFLX
Distributivity signalled by reduplication	✓	✓	✓
Anaphoricity requirement	✓	✓	✓
Participant as distributive key	✓	✓	✓
Time as distributive key	✓	X	X
Space as distributive key	✓	X	X
Variation requirement	✓	X	X
Identity condition	X	✓	✓
Cardinality condition	✓	X	X
Non-identity condition	X	✓	X
Overlap condition	X	X	✓

Motivating a dynamic account

Storing relations between variables

- In sentences with reduplicated elements, the functional dependence between the distributive key and the distributive share is “stored” in the discourse.
- The conditions imposed on interpretation by the reduplicated elements themselves need to be checked, so these dependencies need to be available (Law, 2018).
- Further anaphoric elements may make reference to these dependencies: (20b) may follow (20a).

(20) Telugu

- a. pillalu okari-kosam okaru paṇḍlu teccu-kunn-aaru
children one-BEN one fruits bring-VR-PST.3PL
'The children₁ brought fruits for each other₂'
- b. paṇḍla-nu kaḡitam-lo cutti va||a-ku iccaru
fruits-ACC paper-IN wrap 3PL-DAT give.3PL
'(They)₁ wrapped the fruits and gave them₂'

Dynamic Plural Logic(s)

Review

- Dynamic semantics: The meaning of a sentence or linguistic element is its potential to update the body of information (context).
- The output context of one sentence is the input context of the next.
- Discourse referents are represented as values of an assignment function (a list).

	x	y	...
g	a	b	...

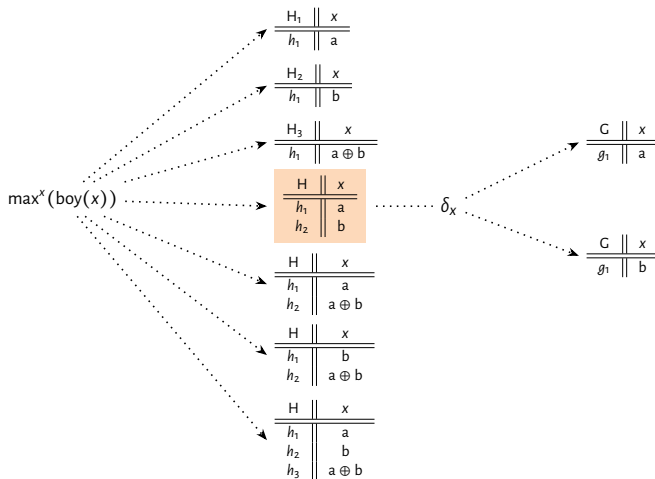
- Definites and indefinites add new individuals to the list. Pronouns retrieve elements from it.
- Predicates are filters: they test whether the elements of the input context are in its denotation. If so, they return the context unchanged. If not, they return the empty context.
- A family of theories extends the idea of a body of information from a single assignment to a set of assignments: a table instead of a list.
- **Relations** between variables can be stored and passed down in the discourse.

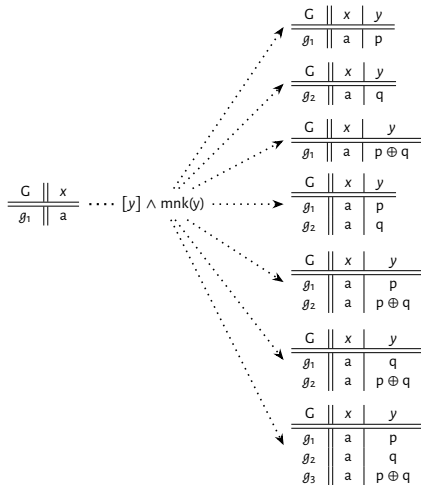
G	x	y	...
g ₁	a	p	...
g ₂	b	q	...
⋮	⋮	⋮	⋮

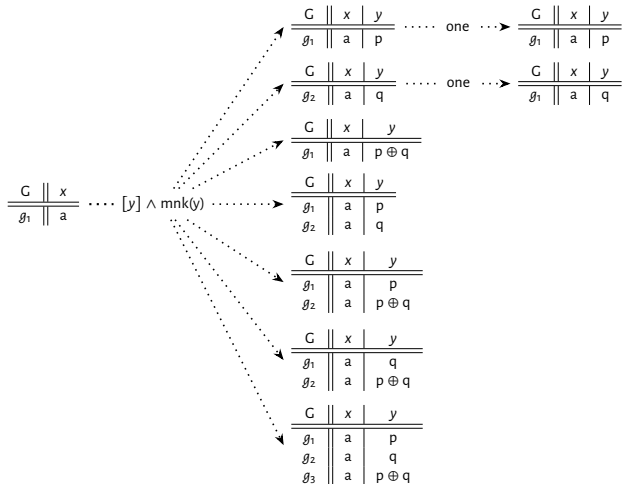
The boys saw one-one monkey

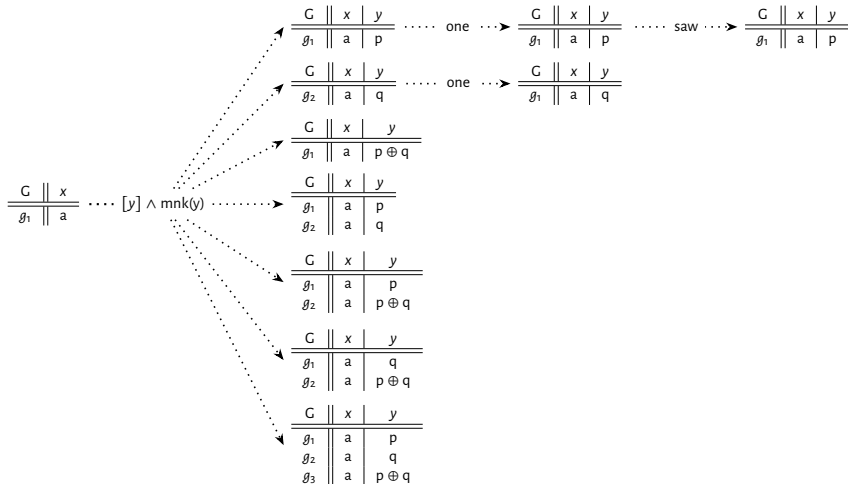
- $\max^x(\text{boy}(x)) \wedge \delta_x[[y] \wedge \text{mnk}(y) \wedge \text{one}(y) \wedge \text{saw } x y] \wedge |y| > 1$
- $\text{boys} = \{a, b\}; \text{monkeys} = \{p, q\}$

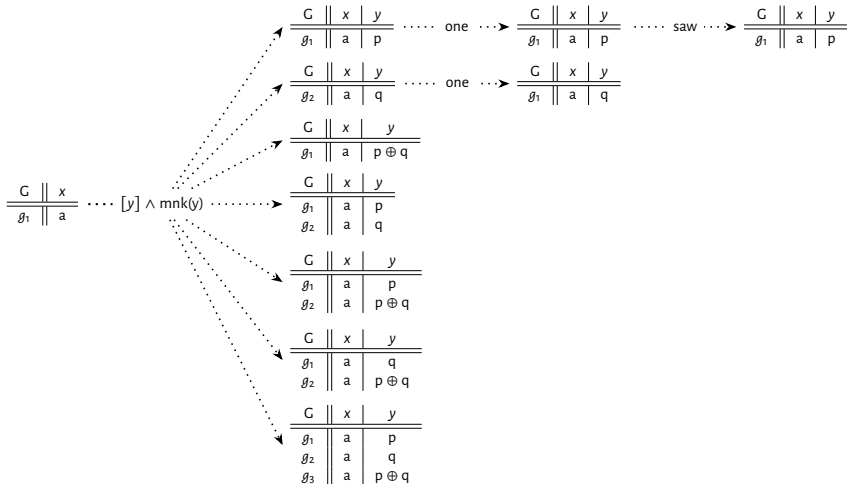
a saw p b saw q



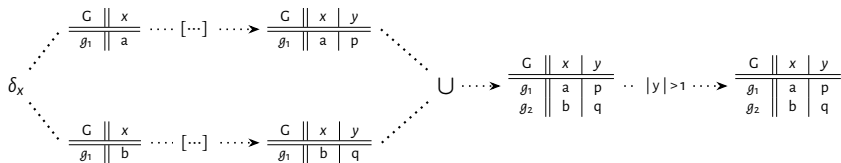








$$\frac{G \parallel x}{g_1 \parallel b} \dots [y] \wedge \text{mnk}(y) \wedge \text{one}(y) \wedge \text{saw } xy \dots \frac{G \parallel x \mid y}{g_1 \parallel b \mid q}$$

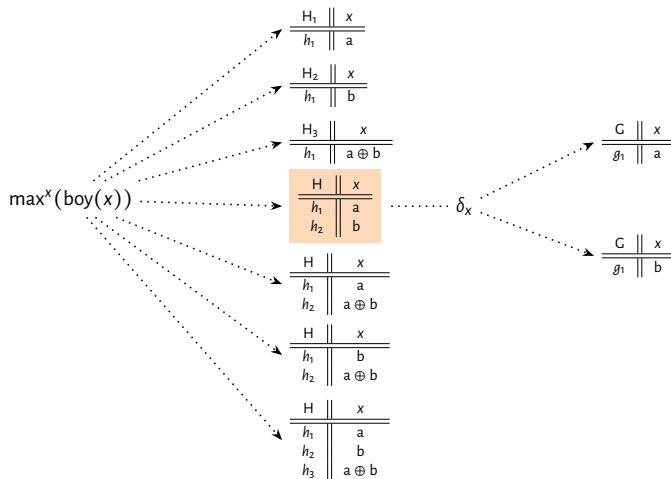


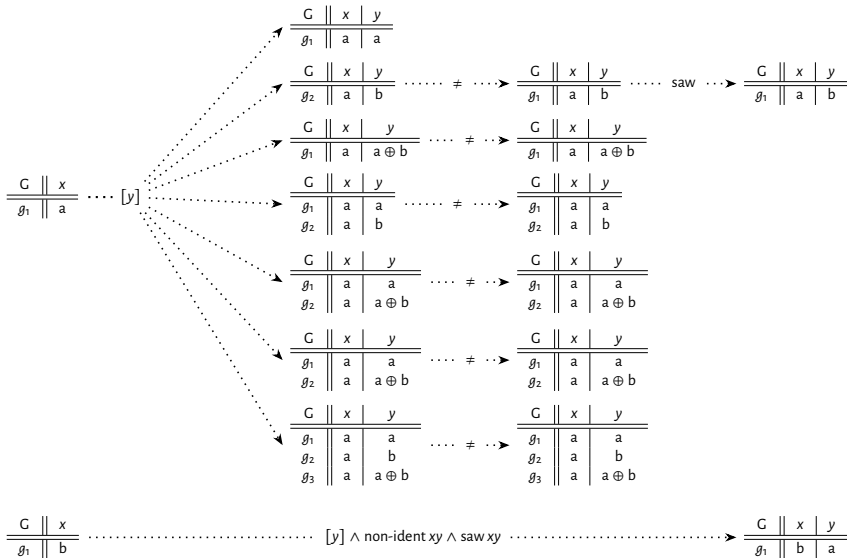
- Now that we have a table where the relations between boys and monkeys are stored, we can follow up this sentence with something like:

(21) Each of them_x thought it_y was cute.

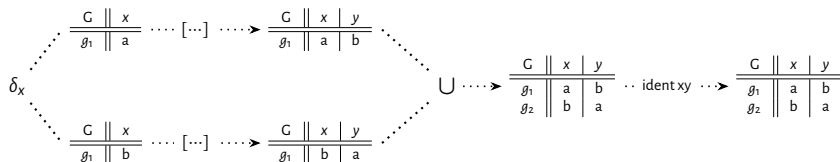
The boys saw each other

- $\max^x(\text{boy}(x)) \wedge \delta_x[[y] \wedge \text{non-ident } xy \wedge \text{saw } xy] \wedge \text{ident } xy$
- $\text{boys} = \{a, b\}$





Reciprocals



- The result above is after splitting the information with a and b in the x -column.
- Except the information states with only one assignment, where $x = a$ or b , all other information states fail one of the two tests: 'saw xy ' or 'non-ident xy '.

Further considerations

- So far we've only considered a strongly reciprocal sentence: Each boy saw every other boy, and was seen by every other boy.
- But we know reciprocals are compatible with a wide range of contexts:
 - (22) The boys sat next to each other.
 - (23) The grandchildren of Vichitravirya fought with each other.
 - (24) The students ask each other about faculty advising styles.
- Our idea is that the cases above can all be accounted for depending on what the state of affairs is like.
- This state of affairs is encoded in the denotation of the predicate.
- But the reciprocal's contribution is uniform: distributive non-identity and global identity.

Reflexives

- Reflexives work exactly the same way as reciprocals.
- The only difference is the test under δ_x contributed by the anaphor
- Compare:

$\max^x(\text{boy}(x)) \wedge \delta_x[[y] \wedge \text{non-ident } xy \wedge \text{saw } xy] \wedge \text{ident } xy$

Reciprocals

$\max^x(\text{boy}(x)) \wedge \delta_x[[y] \wedge \text{overlap } xy \wedge \text{saw } xy] \wedge \text{ident } xy$

Reflexives

Conclusions

A unified analysis is possible for reduplicated numerals and reflexives and reciprocals in Telugu, expanding on Law (2018).

- Anaphoric on a plural antecedent,
- Associate with a distributive operator,
- Introduce constraints on the functional dependencies arising from distributive quantification.
- These functional dependencies may become antecedents of further anaphoric elements.

- Balusu, Rahul. 2006. Distributive reduplication in Telugu. In Christopher Davis, Amy Rose Deal & Youri Zabbal (eds.), *Proceedings of the 36th annual meeting of the North East Linguistic Society*, 39–53. <https://semanticsarchive.net/Archive/mEOYTzkZ/>.
- Balusu, Rahul & Karattuparambil A Jayaseelan. 2013. Distributive quantification by reduplication in Dravidian. In Kook-Hee Gil, Stephen Harlow & George Tsoulas (eds.), *Strategies of quantification*, 60–86. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199692439.003.0004>.
- Guha, Ishani. 2018. *Distributivity across domains: a study of the distributive numerals in bangla*. Massachusetts Institute of Technology dissertation. <http://hdl.handle.net/1721.1/120678>.
- Henderson, Robert. 2014. Dependent indefinites and their post-suppositions. *Semantics and Pragmatics* 7(6). 1–58. <http://dx.doi.org/10.3765/sp.7.6>.
- Jayaseelan, KA. 1996. Anaphors as pronouns. *Studia Linguistica* 50(3). 207–255. <https://doi.org/10.1111/j.1467-9582.1996.tb00350.x>.
- Kuhn, Jeremy. 2017. Dependent indefinites: the view from sign language. *Journal of Semantics* 34(3). 407–446. <https://doi.org/10.1093/jos/ffx007>.
- Law, Jess H.-K. 2018. Binominal *each* and association with the structure of distributivity. Ms. Rutgers University. <https://ling.auf.net/lingbuzz/004289>.
- Murray, Sarah E. 2007. Dynamics of reflexivity and reciprocity. In Maria Aloni, Paul Dekker & Floris Roelofsen (eds.), *Proceedings of the Sixteenth Amsterdam Colloquium*, 157–162. Amsterdam: ILLC/Department of Philosophy, University of Amsterdam. <http://www.semanticsarchive.net/Archive/DgzNzc1Y/>.
- Murray, Sarah E. 2008. Reflexivity and reciprocity with(out) underspecification. In Alte Grønne (ed.), *Proceedings of Sinn und Bedeutung* 12, 455–469. Oslo, Norway: ILOS. <http://www.semanticsarchive.net/Archive/2ZjNGJiN/>.

Singular Reflexives and variation

- A natural question to ask: Why are singular reflexives reduplicated?
- The distribution in this case is bound to be redundant
- There is some variation among speakers that we think works in our favour:
 - Some speakers can use both the simplex and complex reflexives with singular antecedents.
 - For plurals however, they show a strong preference for the complex over the simplex reflexive.

Some assumptions

- Random assignment does not introduce dependency.
- Predicates are evaluated collectively. Law 2018
- The distributive quantifier associated with RedNums and anaphors scopes over the predicate.
- The variation and global identity conditions associated with RedNums and anaphors respectively are evaluated after the predicate, and outside the scope of the distributive quantifier.

Scope of δ

- Guha (2018), following others, takes the lack of cumulative readings to be indicative of a distributive operator:

(25) iddaru pillalu aiduguru tiicarla-ku muuḍu-muuḍu bommalu iccaru
two kids five teachers-DAT two-two toys gave
'Two kids gave 5 teachers two-two toys'

- If each teacher got three toys, then kid₁ could have given three toys to four teachers, and kid₂ three to one
- If each kid gave 3 toys, then (25) cannot be used in a case where kid₁ give one each to three and kid₂ gave one to one and two to the other

- Reciprocals behave similarly

(26) iddaru pillalu aiduguru tiicarla-ku okari-ni okari-ki paricayam ceesukunnaru
two kids five teachers-DAT ONE-ACC ONE-DAT introduce do-VR-3PL
'Two kids introduced five teachers to each other'

(27) iddaru pillalu aiduguru tiicarla-ku okari-ni okaru paricayam ceesukunnaru
two kids five teachers-DAT ONE-ACC ONE introduce do-VR-3PL
'Two kids introduced each other to five teachers'

- Suggests: δ is not restricted to RedNum/anaphor itself
- Located higher on the tree with the reduplicated element in its scope

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