

Subtype readings in Hindi numerical reduplication

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Background

Dependent indefinites

- Numerical reduplication in Hindi can be classified as a 'dependent indefinites.'
- These markers enforce necessary distributivity and are incompatible with wide-scope readings:

(1) Choohon-ne **ek** laddoo kutra
Mice-erg one sweet nibble.pst
'The mice nibbled a laddoo'
The same laddoo? ✓
Different laddoos? ✓



(2) Choohon-ne **ek-ek** laddoo kutra
Mice-erg one-RED sweet nibble.pst
'The mice nibbled a laddoo'
The same laddoo? x
Different laddoos? ✓

- The key can be explicit, as in (2), or implicit, like in the German (Link 1987; pg. 175) and Telugu (Balusu 2006, pg. 3) sentences in (3) & (4):

(3) Je drei **Äpfel** waren faul
? three apples were rotten
'Three apples each were rotten (from different baskets)' [With appropriate context]

(4) Ram renDu renDu **kootu-lu-ni** cuus-ee-Du
Ram 2 2 monkey-pl-acc see-past-3ps
'Ram saw 2 monkeys in each time interval' or
'Ram saw two monkeys in each location'

- Previous analyses of dependent indefinites have relied on the assumption that the key is provided by something unrelated to the share — be it individuals (like in (2) & (3)), events (like in (4)), or situations (Farkas 1997).

Main Points

- Distributive sentences have two parts of meaning:

Mice one-one laddoo nibbled

Key

Share

- Numerical reduplication in Hindi is a 'dependent indefinite'.
- It can build meanings where the key and share come from the same nominal set:

Context: A party with many different kinds of kebab.

Mai-ne do-do **kebab** khaaye
I-erg two-RED kebab eat.pst
'I ate two kebabs of each type'

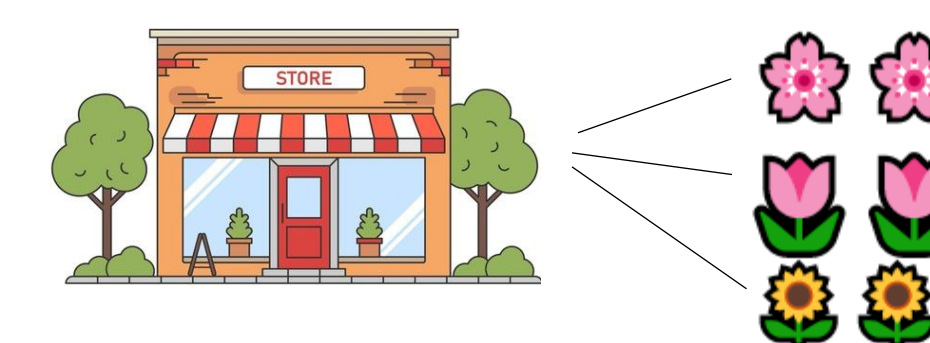
- Previous analyses, which depend on a plurality of events (Balusu 2006; Henderson 2014), or co-indexation of the key and share variables (Brasoveanu & Farkas 2011) cannot account for these readings.

- We present a partition-based analysis with two parts
 - A sortability presupposition** (c.f. Dayal et al. (in prep) on a different aspect of Quechua grammar): captures importance of supporting context.
 - At-issue content** that distributes over this partition: captures distributivity.

Data

Flower Shop Scenario: A flower shop has many different kinds of flowers: lilies, roses, tulips, chrysanthemums. Anu chose two stems from each kind. Her friend says:

(5) Anu-ne **do-do** **phool** chune
Anu-erg two-RED flowers choose.pst
'Anu chose two flowers (of each type)'



Key is different subtypes of share NP!

- Does not have to be subtype → can be size, color, etc.:

Context: A shop with different colors and sizes for the same notebook.

(6a) The teacher 2-2 **notebooks** bought ✓

- AND, a key unrelated to the share NP, like in (3):

Context: A baking contest. A judge has to pick 2 sweets from each contestant's baking products.
(6b) The judge 2-2 **sweets** chose ✓
NP-external, but implicit - similar to example (3)

- Some variation (**overt partitive**):
Anu-ne [un phoolon me-se] do-do chune
Anu-erg [those flowers from] two-red chose.pst

Analysis

- First, we need a way to place restrictions on the context (from Dayal et al.'s (in prep) analysis of Cuzco Quechua plural marker *-kuna*)

Sortability presupposition: $\exists P \Pi_{\text{color/shape/type/size} \dots} (P)(P)$

*Note that we also draw on Balusu (2006), who uses a partition, but of an event (giving sub-events), and distributivity over its cells to account for space/time readings.

- And the at-issue content, which can distribute over this partition:

$\lambda \text{num } \lambda P \lambda Q \forall Z [[Z \in \Pi (P)([P])] \rightarrow \exists y [| \lambda y'. y' \leq y \wedge AT(y') | = \text{num} \wedge y \leq \oplus Z \wedge Q(y)]]$

- Test case with (5):**

$\exists P \Pi_{\text{color/shape/type/size} \dots} (P)(P)$ ✓



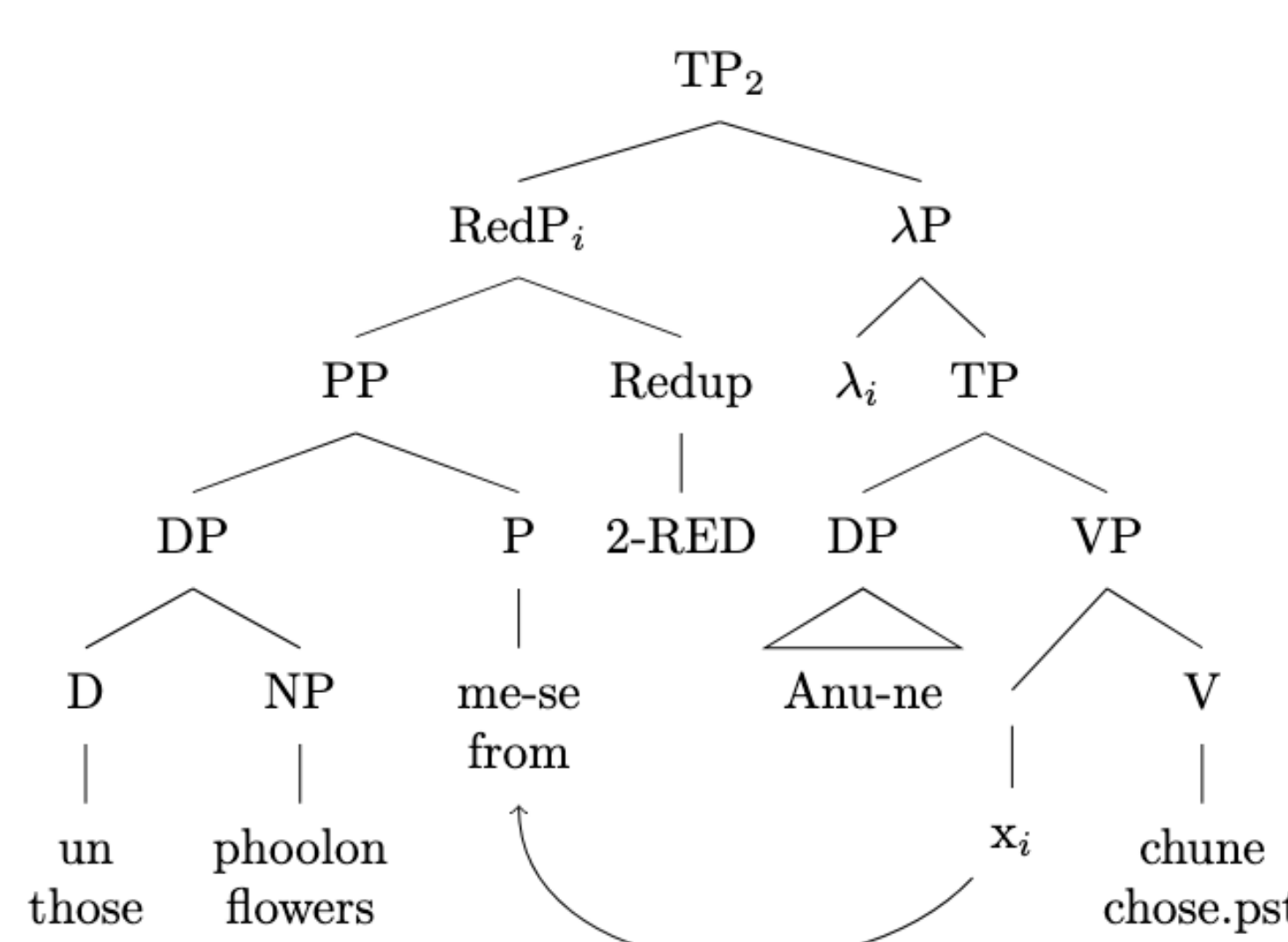
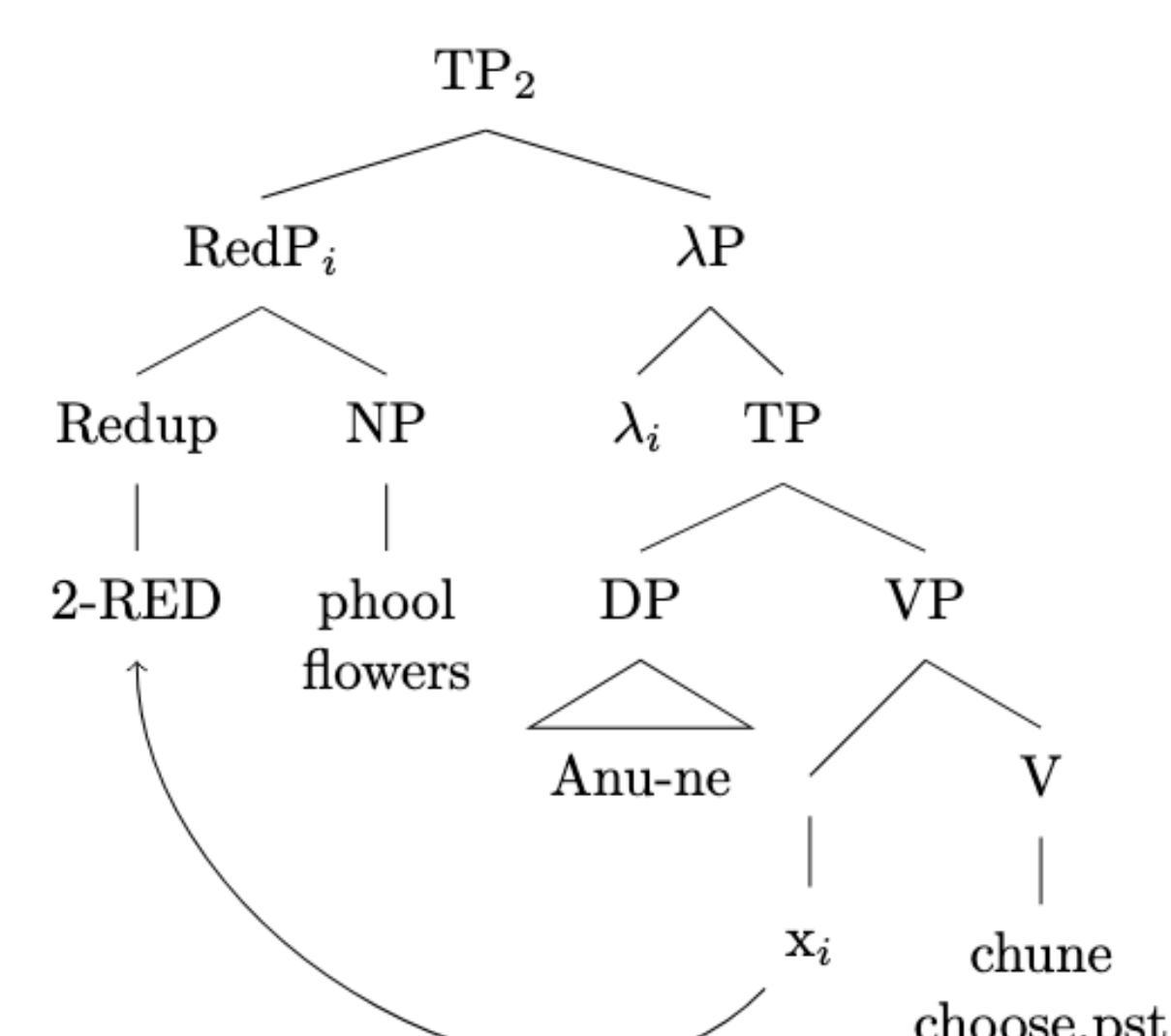
$\forall Z [[Z \in \Pi (P)([FLOWERS])] \rightarrow \exists y [| \lambda y'. y' \leq y \wedge AT(y') | = 2 \wedge y \leq \oplus Z \wedge Chose(Anu)(y)]]$



- Incorporating overt partitive:**

$\forall Z [[Z \in \Pi(P)(\lambda x. x \leq [THOSE.FLOWERS])] \rightarrow \exists y [| \lambda y'. y' \leq y \wedge AT(y') | = 2 \wedge y \leq \oplus Z \wedge Chose(Judge)(y)]]$

- Note:** Property that partition is based on can be a complex of two properties (like size + color in (6a)) or quite ad-hoc (like participant in (6b)).



Extensions & further questions

Extension 1: Ek-ek.

When stressed or focused, the use of reduplication with 'one' can have an 'each and every' reading.

(7) Anu-ne **ek-ek** **phool** khareeda
Anu-erg one-RED flowers buy.pst
'Anu bought all the flowers'

This can be accounted for via an atomic partition (thank you to Tom Mccoy):



Question 1: How can we relate the atomic partition to the presence of stress?

Extension 2: Going back to the classic case (participant-key readings).

We can adopt Balusu's (2006) trivial partition + D-operator analysis. Can account for double distributivity and collective w/ subtype readings too.

(8) Bachchon-ne **do-do** **phool** chune
Kids-erg two-red flowers choose.pst

Participant-key: $\{\{\text{flower}, \text{flower}, \text{flower}\}, \{\text{flower}, \text{flower}, \text{flower}\}\} + \text{VP-level D-operator}$.

Double distributive: $\{\{\text{flower}, \text{flower}, \text{flower}\}, \{\text{flower}, \text{flower}, \text{flower}\}\} + \text{VP-level D-operator}$.

Collective, subtype key: $\{\{\text{flower}, \text{flower}, \text{flower}\}, \{\text{flower}, \text{flower}, \text{flower}\}\} + \text{no D-operator}$.

Amendment to Balusu's (2006) proposal: Reduplication cares about accessing keys – VP D-operator thus contributed by reduplication, not predicate. *Optional* when subtype structure is available.

Question 2: Could we implement this without an additional operator?

Other open questions

- Question of covariation. As of now, covariation for free from partition, but overall picture is not so simple.
- (9) Kids watched 2-2 films.
→ If at different time points (time-key), does not have to be different two films across the kids.
- What is the status of presupposition in the absence of subtype readings?
- Is the inner partitive always there?
- Temporal and spatial keys in Hindi (see, for example (9)).

Conclusion

- The data presented here adds to the typology of possible keys in distributive sentences cross-linguistically. Also attested in Yoruba, Loma, Telugu. Indicates dependent indefinite data in other languages already analyzed should be tested as well.
- The nominal-set partition analysis can account for subtype/implicit key readings not captured by event-based analyses.
- Accounts for dependent indefinites cannot be based only on a multiplicity of events or individuals.

Acknowledgements & Selected Refs.

Thank you also to Ka-Fai Yip for his help in presenting this poster, to Veneeta Dayal, Lydia Newkirk, and Maria Piñango for their continued guidance and support, and to the Semantics Reading Group at Yale. Farkas, D. (1997). Dependent indefinites. In Francis Corblin, Danièle Godard & Jean-Marie Marandin (Eds.), *Empirical issues in syntax and semantics*, (pp. 243–267). Bern: Peter Lang. Balusu, R. (2006). Distributive reduplication in Telugu. *Proceedings of the North East Linguistic Society*, 36. | Henderson, R. (2014). Dependent indefinites and their post-suppositions. *Semantics and Pragmatics*, 7, 6–1.