The Interaction of Distributivity Markers and Nominals: It is all actually about events and subevents

Presentation on Matthewson (2000) and Balusu (2006)
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1.0 General Overview

- Both papers deal with methods of marking distributivity:
    - Matthewson: *pelpála7* in St'át'imcets (reduplicated form of 'one')
    - Balusu: reduplicated numerals in Telugu
- The distributive elements discussed in both papers interact with the nominal domain in some way.
    - St'át'imcets: Matthewson argues *pelpála7* is DP-internal
    - Telugu: Balusu demonstrates that reduplication (under some circumstances) permits distribution over participants.
- However, in both papers, the authors conclude that the relevant dimension of distribution is over events/subevents, where events/subevents are differentiated according to time (St'át'imcets) or time *and* space (Telugu).
    - In neither language is there true distribution over participants in an event.
- **Roadmap:**
    - Sections 2 – 5: Matthewson (2000) on St'át'imcets *pelpála7*
        - §2: Overview of the facts
        - §3: Analysis as a pluractional marker
        - §4: *Pelpála7* is not equivalent to English *each*
        - §5: Relating *pelpála7* to English *occasional*/*occasionally*
    - Sections 6 – 8: Balusu (2006) on Telugu reduplicated numerals
        - §6: Overview of the facts
        - §7: Analysis
        - §8: Deriving available interpretations, blocking unavailable ones.

2.0 Overview of Matthewson (2000) on *pelpála7*

• *Pelpála7* is a distributive element in St'át'imcets.

  - *pelpála7* is formed from the word for 'one' (*pála7* + reduplication).

(1) cát-an'-as s-Laura **pelpála7** i xétsem-a
lift-TR=3ERG NOM-Laura **DISTRIB** DET.PL box-DET
'Laura lifted the boxes distributively.'

Overview of the Proposal

• *pelpála7* is DP-internal, but takes both the nominal and the VP as arguments, like a quantifier.

• *pelpála7* does not mean the same thing as English *each*
  - *pelpála7* does not universally quantify over individuals.

• *pelpála7* shares some properties with pluractional markers.

  - *pelpála7* requires there to be a set of subevents which are temporarally separated from each other.

  - *pelpála7* is distinct from other pluractional markers because it takes both a nominal and a VP argument: it can appear inside DP.

    - Quantifiers in St'át'imcets always attach to a full DP rather than to an NP.

• **Proposal:** *Pelpála7* is a distributive element that is DP-internal but makes a universal statement about subevents $e_1+\ldots+e_n$, rather than about atomic individuals.

• *Pelpála7* and *pipála7* (its equivalent in Lower St'át'imcets) can appear in predicative position (2) or attach to either a subject or object DP (3a,b).

(2) **pipápla7** lh-7ulhcw-wít-as
DISTRIB(HUMAN) when-enter-3PL-3CONJ
'They came in one at a time.'
(They were one at a time when they entered).

(3) a. [**Pelpápla7** i smelhmúlhats-a] cat-an'-táli ti tíipvl-a
DISTRIB(HUMAN) DET.PL woman(PL)-DET] lift-TR-TOP DET table-DET
'The women lifted the table one at a time.'

b. ts'eq'-n-ás s-Mary [**pipála7** i xétsem-a]
mash-TR-3ERG NOM-Mary **DISTRIB** DET.PL potato-DET
'Mary mashed the potatoes one at a time.'

3.0 Analysis

• The analysis will focus on the following sentence, repeated from above.

(4) [**Pelpápla7** i smelhmúlhats-a] cat-an'-táli ti tíipvl-a
[**DISTRIB**(HUMAN) DET.PL woman(PL)-DET] lift-TR-TOP DET table-DET
'The women lifted the table one at a time.'

• There must be an event which consists only of liftings of the table by atomic parts of the group of women picked out by the DP.

• Matthewson proposes the semantics in (5) for *pelpála7*.

(5) $[[pelpála7]] = \lambda x \lambda R_{est} \lambda e' [\exists e_1 \ldots \exists e_n [e' = e_1 + \ldots + e_n \ \& \ \forall e_n \ \exists y \ [y < x \ \& \ atom(y) \ \& \ R(y)(e_n)]]]$

• The sentence in (4) has the denotation below:

(6) $\exists e' \exists e_1 \ldots \exists e_n [e' = e_1 + \ldots + e_n \ \& \ \forall e_n \ \exists y \ [y < the.women \ \& \ atom(y) \ \& \ agent(y)(e_n) \ \& \ lift(the.table)(e_n)]]$
"There is an event *e'* which is the sum of subevents $e_1 \ldots e_n$ and for all e_n, e_n is a lifting of the table and there is an atomic part of the women who is the agent of e_n

3.1 *Pelpála7* infelicitous in contexts containing both distributive and non-distributive liftings

• Speakers rejected contexts containing both distributive and non-distributive liftings. Speakers correct the sentence by adding an extra description of the non-distributive actions: *p* and then *q* (where *p* is distributive and *q* is non-distributive)

(7) Context: There were four women. Victoria lifted the table by herself, Anne lifted it by herself, and Mary and Elizabeth lifted it together.

[**Pelpápla7** i smelhmúlhats-a] cat-an'-táli ti tíipvl-a
[**DISTRIB**(HUMAN) DET.PL woman(PL)-DET] lift-TR-TOP DET table-DET
'The women lifted the table one at a time.'

• Sentences with *pelpála7* become fine if it is made explicit that the non-distributive liftings are not part of the same event as the distributive liftings.

• **Summary:** For a *pelpála7* sentence to be accepted, there has to be a salient event which has the required property of total distributivity.

- Unstructured contexts fail to meet this requirement. Why? There are two possibilities.
    - Principles for the individuation of events force speakers to consider the *maximal* salient event.
    - Maybe rejected sentences aren't false but are a poor way of describing what happened: "they give an arbitrarily selective description of a complicated scenario."

- **Given the data in Section3, Matthewson makes the following prediction:** *pelpála7* sentences will be accepted only if there is a salient event consisting only of distributive actions, which is separated by a clear event boundary from non-distributive actions.

- It appears that *pelpála7* permits events to be divided into subevents only if the subevents are temporarily separated from each other.
    - E.g., (2), (3a,b)

- Situations with subevents separated in space but not in time were rejected by consultants:

(8) Context: Some potatoes are lined up on the counter, with space in between them, and a board is pressed on top of them, mashing them all at the same time.

[**pepála7-usa7** i xétsem-a] ts'eq'-n-ás s-Mary
DISTRIB-round DET.PL potato-DET mash-TR-3ERG NOM-Mary
'Mary mashed the potatoes one at a time.'

Final analysis

(9) $[[pelpála7]] = \lambda x \lambda R_{est} \lambda e' [\exists e_1 \ldots \exists e_n [e' = e_1 + \ldots + e_n \ \& \ \forall e_n \ \exists y \ [y < x \ \& \ atom(y) \ \& \ R(y)(e_n)] \ \& \ \forall e_n , e_m [\neg \ \tau(e_n) \ o \ \tau(e_m) \ ]]]$

(10) [[*pelpála7 det women lifted the table*]] = "There is an event *e'* which is the sum of subevents $e_1 \ldots e_n$, and for all e_n, e_n is a lifting of the table and there is an atomic part of the women who is the agent of e_n, and for all e_n e_m, the running times of e_n and e_m do not overlap"

4.0 *Pelpála7* is not equivalent to English *each*

- Setting aside the analysis developed above, perhaps *pelpála7* could be usefully compared to English *each*.

- A possible lexical entry (modeled on Tunstall (1998)) is in (11).

(11) $[[pelpála7]] = \lambda x \lambda R_{est} \lambda e [R(x)(e) \ \& \ \forall y [\ [\ y < x \ atom(y)] \rightarrow \exists e' \ [e' < e \ \& \ R(y)(e')]]]$

• What does the analysis predict?

(12) [**pelpápla7** i smelhmúlhats-a] cat-an'-táli ti tíipvl-a
DISTRIB(HUMAN) DET.PL woman(PL)-DET lift-TR-TOP DET table-DET
'The women lifted the table one at a time.'

∃e [agent (the.women) (e) & lift (the.table) (e) & ∀y [[y < the.women & atom(y)] → ∃e' [e' < e & agent(y)(e') & lift(the.table)(e')]]]

There is an event *e* which consists of one or more liftings of the table, and the women are cumulatively the agent of *e*, and for each atomic individual *y* who is part of the women, there's a subevent *e'* of *e* which is a lifting of the table and whose agent is *y*.

• There is evidence from two sources, however, that *pelpála7* is not equivalent to English *each*.

• **First,** *pelpála7* does not require distribution over the maximal contextually salient group of individuals:

(13) Context: There are 4 apples. Lisa weighs 3 out of the 4, one at a time.
tswáw's-en-as s-Lisa [**pelpál7**-usa7 i áopels-a]
weigh-TR-3ERG NOM-Lisa [**DISTRIB**-round DET.PL apple-DET]
'Lisa weighed the apples one at a time.'

• (13) in English would be false in this context.

• What are the sources of the difference? Two possibilities.

1. *pelpála7* is not a universal quantifier over individuals.
2. *pelpála7* is a universal distributor but the DP it attaches to doesn't have to pick out the maximal contextually salient group of individuals.

• Matthewson argues that the first possibility is the correct one.[1]

• Second, *pelpála7* requires that subevents be separated from each other in time: subevents cannot be separated due to there being "sufficient interest" in the individual objects.

(14) Context: You invited a bunch of people. You want to explain what happened.
[**pelpápla7** i ucwalmícw-a] t'iq
DISTRIB(HUMAN) DET.PL person-DET arrive
'The people arrived one at a time.'
?# 'Each person arrived.'

[1] The second possibility can't be the right one since there are ways in St'át'imcets of making DPs pick out the maximal contextually salient group of individuals. Even so, *pelpála7* still doesn't force all individuals to participate.

5.0 Similarities between *pelpála7* and English *occasional*

- Analysis of *pelpála7* has some similarities with English adverb/adjective pairs like *occasionally*/*occasional*. Matthewson argues that this is a potentially useful comparison.

(15) An **occasional** sailor strolled by.
= **Occasionally**, a sailor strolled by.

- Issue: how does an element in adjective position take semantic scope over the whole sentence?
  - Zimmermann (2000): adjective combines with the article to create a complex element [D+A], which functions as a pluractional quantifier.
  - Pluractional quantifier takes a nominal argument *and* a VP argument, and specifies that there are some non-overlapping subevent/individual pairs.

- Zimmermann's analysis of (15) is as follows:

(16) There are some pairs <e,x>, with *e* part of a (contextually given) even *e**, and *x* a sailor, such that *e* is a strolling-by of *x*, and any two strolling-by events of a sailor occur at separate points in time and are performed by different individuals.

- Both *occasional* and *pelpála7* have pluractional properties (non-overlapping set of subevents), yet both appear to be DP-internal and take a nominal as well as a VP argument.

- Furthermore, like *occasional*, *pelpála7* has a non-DP internal counterpart. Matthewson posits that this usage can be regarded as parallel to an English adverbial usage.

(17) **pelpála7**-wit i smelhmúlhats-a **lh**-cat-an'-ítas ta tíipvl-a
DISTRIB-3PL DET.PL woman(PL) **when**-lift-TR-3P.ERG DET table-DET
'The women lifted up the table one at a time.'
(The women were separate when they lifted up the table.)

6.0 Overview of Balusu (2006) on Telugu Reduplicated Numerals

- In Telugu, numerals can be reduplicated or non-reduplicated.

- Non-reduplicated numerals have collective or distributive interpretations:

(18) ii pilla-lu renDu kootu-lu-ni cuus-ee-ru
these kids-PL 2 monkey-PL-ACC see-PAST-3PPL
Lit. 'These kids saw 2 monkeys.'

a. These kids saw 2 monkeys. Collective
b. These kids saw 2 monkeys each. Distributive

- Reduplicated numerals, by contrast, *always* give rise to distributive readings. These distributive readings are described (followed Choe 1987) as 'participant,' 'temporal,' and 'spatial' key readings.

(19) ii pilla-lu **renDu renDu** kootu-lu-ni cuus-ee-ru
these kids-PL **2 2** monkey-PL-ACC see-PAST-3PPL
Lit. 'These kids saw 2 2 monkeys.'

a. These kids each saw 2 monkeys. Participant key reading
b. These kids saw 2 monkeys in each time interval. Temporal key reading
c. These kids saw 2 monkeys in each location. Spatial key reading

Terminology:

- Reduplication pluralizes the numeral phrase:

(20) renDu kootulu '2 monkeys'
renDu renDu kootulu plural of '2 monkeys'

- Follows Choe (1987) in assuming that a distributive quantifier is a universal quantifier with a particular restriction called the SORTING KEY. The DISTRIBUTIVE SHARE is the quantifier's scope.
    - The members of the DISTRIBUTIVE SHARE need not be exhaustively used up when being distributed over, while the members of the SORTING KEY must be exhaustively used up.

D-operator	*sorting key*	*distributive share*
∀	set in restriction	entities in scope

Overview of Proposal

- *RedNum* has a D(istributivity) operator associated with it (or, *RedNum* actually is D).
    - The D operator takes an event as its sorting key.
    - An event can only be divided into partitions along spatial or temporal dimensions.
    - The event structure can be divided into non-trivial partitions, or one (trivial) partition.
    - D is associated with a plurality requirement. *RedNum* pluralizes the numeral phrase.

- For some constructions, only the temporal and spatial key readings are available. For other constructions, all three readings are available.

- **Descriptive Generalizations:**
    - The *RedNum* DP can never be the sorting key.
    - *RedNum* can occur in both subject and object position.

6.1 Only Temporal and Spatial Key Readings

- In a transitive construction with a singular subject or when both the DPs in a transitive construction have *RedNum*, and in the intransitive *RedNum* construction, only the spatial and temporal key readings are possible.

DP with* RedNum *as the only DP

(21) renDu renDu kootu-lu egir-i-niyyi
2 2 monkey-PL jump-PAST-3PPL
Lit. '2 2 monkeys jumped.'
a. 2 monkeys jumped in each time interval. Temporal key
b. 2 monkeys jumped in each location. Spatial key

SORTING KEY: temporal aspect or spatial aspect of the event
DISTRIBUTIVE SHARE: 2 2 monkeys

DP with* RedNum *in a transitive construction with a singular DP as the subject

(22) Raaamu renDu renDu kootu-lu-ni cuus-ee-Du
Ram 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'Ram saw 2 2 monkeys.'
a. Ram saw 2 monkeys in each time interval. Temporal key
b. Ram saw 2 monkeys in each location. Spatial key

Both arguments are* RedNum *DPs

(23) iddaru iddaru pilla-lu naalugu naalugu kootu-lu-ni cuus-ee-ru
2 2 kid-PL 4 4 monkey-PL-ACC see-PAST-3PSG
Lit. '2 2 kids saw 4 4 monkeys.'
a. 2 kids in each time interval saw 4 monkeys in each location. Temporal and Spatial
b. 2 kids in each time interval saw 4 monkeys in each time interval. Temporal and Temporal
c. 2 kids in each location saw 4 monkeys in each time interval. Spatial and Temporal
d. 2 kids in each location saw 4 monkeys in each location. Spatial and Spatial

6.2 Participant, Temporal, and Spatial Key readings

- In a transitive construction with a plural or universal, the participant key reading is available along with the spatial and temporal key readings.

DP with* RedNum *can occur in a transitive construction with a plural DP as the subject

(24) pilla-lu renDu renDu kootu-lu-ni cuus-ee-Du
kid-PL 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'The kids saw 2 2 monkeys.'
a. The kids each saw 2 monkeys. Participant key
b. The kids saw 2 monkeys in each time interval. Temporal key
b. Ram saw 2 monkeys in each location. Spatial key

DP with* RedNum *as the subject in a transitive construction with a plural DP as the object

(25) iddaru iddaru pilla-lu kootu-lu-ni cuus-ee-ru
2 2 kid-PL monkey-PL-ACC see-PAST-3PPL
Lit. '2 2 kids saw [the] monkeys.'
a. Each of the monkeys were seen by 2 kids. Participant key
b. The monkeys were seen by 2 kids in each time interval. Temporal key
c. The monkeys were seen by 2 kids in each location. Spatial key

RedNum *DP with universal quantified DP in subject position*

(26) Prati pillavaaDu renDu renDu kootu-lu-ni cuus-ee-Du
Every kid 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'Every kid saw 2 2 monkeys.'
a. Every kid saw 2 monkeys. Participant key
b. Every kid saw 2 monkeys in each time interval. Temporal key
c. Every kid saw 2 monkeys in each location. Spatial key

7.0 Analysis

7.1 Spatial and Temporal Key Readings

• Consider the intransitive and singular subject constructions, repeated below:

(27) renDu renDu kootu-lu egir-i-niyyi
2 2 monkey-PL jump-PAST-3PPL
Lit. '2 2 monkeys jumped.'

(28) Raaamu renDu renDu kootu-lu-ni cuus-ee-Du
Ram 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'Ram saw 2 2 monkeys.'

• *RedNum* has a D operator associated with it that takes an event as its argument.

- The D Operator associated with *RedNum* causes a sentence like (27) to have the following semantics.

(29) a. [[(10)]] = $\exists e\, \exists \pi(e)\, [\forall e' \in \pi(e)\, \exists X[\text{two\_monkeys}(X) \wedge \text{jumped}(X,e')]]$
b. $|X: \text{two\_monkeys}(X) \wedge \text{jumped}(X,e)\}| > 1$
c. There was an event *e* such that for every relevant part *e'* of *e*, two monkeys jumped in *e'*, where there were two or more two-monkey groups.

7.2 Readings with Universals

- Sentences with universal subjects receive a participant key reading in addition to the temporal and spatial key readings.

(30) Prati pillavaaDu renDu renDu kootu-lu-ni cuus-ee-Du
Every kid 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'Every kid saw 2 2 monkeys.'
a. Every kid saw 2 monkeys. Participant key
b. Every kid saw 2 monkeys in each time interval. Temporal key
c. Every kid saw 2 monkeys in each location. Spatial key

- **The temporal and spatial readings are easy to derive:**

(31) a. $\exists E[\forall y[\text{kid}(y) \rightarrow \exists e \in E\, \exists \pi(e)\, [\forall e' \in \pi(e)\, \exists X[\text{two\_monkeys}(X) \wedge \text{saw}(y, X,e')]]$
b. $|X: \text{two\_monkeys}(X) \wedge \exists y[\text{kid}(y)[\text{saw}(y,X,e)\}| > 1$
c. "There is an event E such that for each of the kids that is an event *e* which is a part of *E* such that there is a partition of *e* such that the kid saw 2 monkeys in each cell of the partition associated with him/her" (10)

- **Deriving the Participant key reading is more difficult:**

- In the participant key reading of (30), the universal QP 'every kid' apparently acts as the sorting key…but only apparently.
    - Puzzling: "The universal quantifier already associates with its own distributive operator. This is a problem if we take the view that the quantifier phrase *every kid* is contributing the sorting key for the D-operator associated with *RedNum*."
    - This is a problem because we'd be asking *every kid* to associate with two distributive operators.

- **Alternative:** participant key readings are also event key readings.
    - **The partition is trivial:** the whole event is treated as a single cell.

(32) The trivial partition: $\pi(e) = \{e\}$

- The interpretation of the participant key reading of (30) is just the same as the interpretation of the temporal and spatial key readings (31).

- The only difference between the spatial/temporal key readings and the participant key reading is that in the later case, the partition is trivial.

    - If the partition is trivial, then all the monkey-sighting events by a particular kid (even though they happen at different times or places) are lumped together: for every kid, there will be just 2 monkeys that he or she saw.

    - The plurality condition contributes that there must be more than two monkey pairs.

7.3 Blocking the Participant Key Reading for Singular DP Constructions

- The use of a trivial partition doesn't generate any unwanted readings when a singular DP is used instead of a QP.

    - The plurality requirement will block the participant key reading of a *RedNum* construction with a singular subject.

(33) Raaamu renDu renDu kootu-lu-ni cuus-ee-Du
Ram 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'Ram saw 2 2 monkeys.'
a. Ram saw 2 monkeys in each time interval. Temporal key
b. Ram saw 2 monkeys in each location. Spatial key
c. *Ram saw 2 monkeys. Participant key

- (33) has the following interpretation:

(34) a. $\exists e\, \exists \pi(e)\, [\forall e' \in \pi(e)\, \exists X[\text{two\_monkeys}(X) \wedge \text{saw}(\text{ram}X,e')]]$
b. $|X: \text{two\_monkeys}(X) \wedge \text{saw}(\text{ram},X,e)\}| > 1$
c. There exists an event *e* and such a partition of *e* such that 2 monkeys were seen by Ram in each of the cells of the partition. The number of monkeys seen by Ram in that *e* is greater than 2.

- The participant key reading is blocked because if Ram's monkey sightings are lumped together, there will only be two monkeys. The plurality requirement of *RedNum* requires there to be at least two monkey pairs.

7.4 Readings with Plurals

• Spatial, Temporal, and Participant key readings all available.

(35) pilla-lu renDu renDu kootu-lu-ni cuus-ee-Du
kid-PL 2 2 monkey-PL-ACC see-PAST-3PSG
Lit. 'The kids saw 2 2 monkeys.'
a. The kids each saw 2 monkeys. Participant key
b. The kids saw 2 monkeys in each time interval. Temporal key
b. The kids saw 2 monkeys in each location. Spatial key

• Spatial and temporal key readings arise as before: there exists an *e* such that there is a partition of *e* in which 2 monkeys were seen by the kids in each of the cells of the partition. The number of monkeys cumulatively seen by the kids is greater than 2.

- The partition of the event is non-trivial.
- In these readings, the predication with the plural subject is interpreted as collective or cumulative.

• The Participant reading is made possible when (a) predication is interpreted as distributive and (b) the partition on the event is trivial.

(36) a. $\exists E[\forall y \in \text{the.kids} [\exists e \in E [\forall e' \in \pi(e) \exists X[\text{two\_monkeys}(X) \wedge \text{saw}(y, X, e')]]$
b. $|X: \text{two\_monkeys}(X) \wedge \exists y[y \in \text{the.kids} \wedge \text{saw}(y,X,E)\}| > 1$
c. There is an event *E* such that for each of the kids there is an event *e* which is part of *E* such that there is a partition of *e* such that the kid saw 2 monkeys in every cell of *e*. Altogether, more than one monkey-pair was seen by the kids in *E*.