## Pluractional derivation and plural inflection: The case of Seri

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# Introduction

So far we have explored the compositions of pluractionality from a variety of perspectives:

- Root vs Non-root (+parameterized w.r.t. cumulativity)
- Scopeless vs Split-Scope distributives

Today we will consider the case of Seri, whose pluractional systems is incredibly challenging for compositionality.

We will not be having solutions, but instead I want to introduce you to problems. Show why some simple solutions fail and then consider ways forward.

## Seri Background

 Seri is spoken in northwest Mexico, in two villages on the coast: Haxöl lihom/El Desemboque and Socaaix/Punta Chueca



Figure: The Seri region in Mexico

Isolate, approx. 900 speakers (Ethnologue 2007 estimate)

## Stem alternations

#### Seri verbs

- Two cross-classifying features
  - Subject number [singular, plural]
  - Verbal number [neutral, multiple, distributional] (previously only 2 values had been recognized)

	'wrap'	neutral	multiple	distributional
ect iber	singular	iyacapnij	iyacapanl	iyacapnalca
subj num	plural	iyacapnalcoj	iyacapzil	iyacapzilca

event number

• In principle, 6 cells but in the overwhelming majority of cases, if there is a separate distributional form, it is in the singular subject paradigm

	'drag'	neutral	multiple	distributional
ject nber	singular	hant iyootox	hant iyootoxim	hant iyootyax
dua	plural	hant iyootyajc	hant iyootyaxlca	

#### event number

Seri stands out for in having a rich system of pluractionality that is interwoven with it's system of plural subject agreement. It is also extremely morphologically complex, having two striking properties:

- No one-to-one mapping
- Incremental scale of plurality

For the following diagrams, I am borrowing directly from my Co-PI Jérémy Pasquereau's work with Matthew Baerman (2019, Multidimensional features with linear morphology)

#### One inventory of exponents for all feature values

- For every exponent\_x, it is not possible to associate  $it_x$  with one bundle of feature values

SG NEUTRAL	SG MULT	SG DIST	PL NEUTRAL	PL MULT	PL DIST	
-taxnij	-taxanl		-taxnal-ca	-taxnal-coj		'scold'
-atox	-atoxim	-atyax	-atyaj-c	-atyax-lca		'stretch'
-tahoiij		-tahoiil-c	-tahoiil-coj			'make tubular'
-tzam	-tzam-tim	-tzamlqu-im	-tzamlc-am			'corner, attack'
-tanamj	-tanaml-c		-anaml-coj	-anaml-cam		'hurry'
-tazaain-im	-tazaiin-im		-azaail-cam	-azaiil-cam		'anchor'
-tpoc	-tpoct-im		-tpocl-im	-tpocal-am		'fall'
-tpazj-c	-tpaxlax		-tpazlax	-tpazlax-lca		'be scattered'
-tineezil-ca	-tineezil-im		-tineezil-coj	-tineezil-am		'be raspy'
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# Questions

All of this discussion leads to the following semantic questions:

- What semantically grounds the "scale of plurality"—more pointedly, in what sense is a distributive pluractional with a singular subject "less plural" than a non-pluractional verb with a plural subject?
- Relatedly, why should plural agreement and pluractionality even be on the same scale?

And a huge compositional question with respect to the monotonicity hypothesis.

Kiparsky 1982 makes a proposal for the morphology-semantics interface that word formation operations "add but do not eliminate some element of meaning in a word." This adage as since been reified as the *monotonicity hypothesis* and shown to hold even against prima facie counterexamples (e.g., Koontz 2007).

- On one hand, incrementality in Seri plural paradigms is a striking example of the success of the monotonicity hypothesis—more exponents means more plurality.
- At the same time, how this monotonic mapping between form and meaning is established is deeply mysterious.

If we want to maintain the hypothesis that the monotonicity hypothesis holds due to word formation operations that are compositionally interpreted, we need to assume a kind of conspiracy between semantics and morphology to maintain the appearance that the monotonicity hypothesis holds.

- Seri would have some number of verb formation operations whose semantic contribution is monotonically increasing, but whose mapping to morphological exponents, while not one-to-one, also respects monotonicity.
- More pointedly, what prevents Seri morphology from mapping a semantically complex form to a simpler set of exponents, given that it allows fairly opaque mappings from forms to exponents?

Conspiracies like this are disconcerting, but they also provide us with a critical empirical opportunity to make theoretical progress on understanding the source of the monotonicity of word formation operations.

To address these questions we need a better understanding of the meaning of DIST and MULT in Seri. For that we will turn to the analysis in Co-PI's 2020 SULA paper with Patricia Cabredo Hofherr (Two types of pluractionality in Seri).

# Description of MULT and DIST

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(1) Context: Juan opened the door to the house (once) and we all entered.
 # Juan quih hahoot hac cöiyeemetim / cöiyeemla.
 Juan det door DEF.SG 3I0.3;3.RLYO.CAUS.open.MULT 3I0.3;3.RLYO.CAUS.open.DIST
 Juan opened the door.

However if Juan opened several doors one after the other, both forms are good.

(2) Context: Juan opened the doors one-by-one to the house and we all entered. Juan quih hahootj coi cöiyeemetim / cöiyeemla. Juan det door.PL DET.PL 3IO.3;3.RLYO.CAUS.open.MULT 3IO.3;3.RLYO.CAUS.open.DIST Juan opened the doors.

Both  $\ensuremath{\operatorname{MULT}}$  and  $\ensuremath{\operatorname{DIST}}$  forms are found with plural objects

 $\ensuremath{\mathrm{MuLT}}$  and  $\ensuremath{\mathrm{DIST}}$  forms are also found with singular objects

- (3) Context: Juan opened the (same) door repeatedly. Juan quih hahoot hac cöiyeemetim. Juan det door DET.SG 3IO.RLYO.CAUS.open.MULT Juan opened the door multiple times.
- (4) Juan quih haaco cap cöiyeemla. Juan det house DET.SG 3IO.3;3.RLYO.CAUS.open.DIST Juan opened several doors/windows in the house. [Questionnaire2FT5]

- (5) Context: In a game, Juan opened a different door every day last week.
  a.# Juan quih hahoot zo cöiyeemetim / cöiyeemla. Juan det door.sg indef.sg 310.3;3.RLYO.CAUS.open.MULT 310.3;3.RLYO.CAUS.open.DIST Juan opened a door.
  - b. Juan quih hahootj pac cöiyeemetim / cöiyeemla.
    Juan DET door.pl indef.pl 310.3;3.RLYO.CAUS.open.MULT 310.3;3.RLYO.CAUS.open.DIST Juan opened doors.

- Both MULT and DIST forms are sensitive to event number
  - They are not compatible with one-event scenarios
  - They are compatible with multiple-event scenarios
- They do not mark object number agreement
- Like other pluractional markers (Laca 2006 and references therein), they do not multiply a singular indefinite DP in their scope
- In what follows, we describe and contrast some salient properties of these two forms wrt
  - event distribution and individuation
  - argument orientation
  - scope wrt quantifiers

# Description of MULT and DIST

## Individuating (sub-)events through event distribution

- Events in general have a time, a participant, a location, etc
- (6) Yesterday, my friends visited Puerto Libertad.
  - Pluractional forms can be licensed by establishing distributive dependencies between the multitude of events and a multitude of times or participants or locations (Dressler 1968, Cusic 1981)
  - E.g. this sentence is true if each of my friends visited Puerto Libertad just once at the same time but separately



Is distribution (over any argument) enough to license a pluractional form in Seri?

## MULT requires temporal distribution

(7) Juan quih xiica an iqueeacalca coi hant iyootoxim. Juan DET suitcases DET.PL land 3;3.RLYO.carry.mult Juan carried the suitcases. [Questionnaire2FT5]



#### Picture B, MULT: false

S ITUACIÓN : 637A TARDO VI A JUAN ARRAITRAIDO SUS MALETAS . TONÍA 3 MALETAS, ENTENCOS USÓ UNAS CUCRDAS . 1/2/2



## DIST requires distribution over participants

Juan quih xiica an iqueeacalca coi hant iyootyax.
 Juan DET suitcases DET.PL land 3;3.RLYO.carry.dist
 Juan carried the suitcases. [Questionnaire2FT5]



#### Picture B, DIST: true

S ITUACIÓN : 637A TARDE VI A JUNN ARRAIRAIDO SUS MALETAS . TENÍA 3 MALETAS, ENTENICOS USÓ UNAS EUCRDAS. 1/2/2



## Event individuation depends on configuration of theme

(9) Juan quih xiica an iqueeacalca coi hant iyootyax. Juan DET suitcases DET.PL land 3;3.RLYO.carry.DIST Juan carried the suitcases. [Questionnaire2FT5]

Picture B, DIST: true

S ITUACION : 6377 TARDE VI A JUAN ARRAITRANDO SUS MALETAS . TENÍA 3 MALETAS (MECNICIS USÓ UNAS CUCEDAS. 1/2/3



#### Picture C, DIST: false

SITUACIÓN : BETA TARDE VI A JUAN ARENTRANDO DU<sup>3</sup> MULETAL TONÍN TRES MALETAS, ANTONICE - UNIÓ UNA CARRETA RORA LLOMALAN A SU CALA.



#### Picture D, DIST: true

SITUACION : GATA TARDE VI A TVAN ARRAITRANDO SU DALITAS, TRIÁN TRES MRETAL, ENTINGES BLÓ WAZ COBEDA" PARA NETALINA UNA OTRAN DE LA OTRA.



## Event individuation depends on configuration of theme

- Problem with picture C: there is only one event of 'pulling'
- In pictures B and C: three events of 'pulling'
  - picture B: three events of pulling (one suitcase) by Juan
  - picture C: one event of pulling by Juan + two events of pulling by another suitcase



- ▶ MULT can distribute over any argument (e.g. subject), in addition to time
- DIST must distribute over the theme argument
- (10) Context: Several women found an old shirt. They dyed it yellow one after the other.

Cmajiic coihaficj ziyamasolam/ #iyamasloj.woman.PL DET.PL shirtINDEF.SG 3;3.RLYO.CAUS.yellow.MULT.PL3;3.RLYO.CAUS.yellow.DIST.PLThe women dyed a shirt yellow.SC on DIST-form: it means they painted yellow spots

- ▶ Distribution over the subject and times: ok for MULT, not enough for DIST
- We interpret this as DIST requiring distribution over its theme argument independently of other distributive options being available
- DIST must distribute over the theme argument (object or PP)
- (11) a. \*Kika quih poosj quih hehe quih tazo iiqui iyahizlca. Kika DET rope DET pole DET one [3POSS.]towards 3;3.RLYO.attach.DIST Int. Kika tied the rope to one pole.
  - b. Kika quih poosj quih hehet pac iiqui iyahizlca.
     Kika DET rope DET pole.pl indef.pl [3POSS.]towards 3;3.RLYO.attach.DIST
     Kika tied the rope to poles.
  - c. Kika quih poosilca quih hehe quih tazo iiqui iyahizlca. Kika DET **rope.pl det** pole DET one [3POSS.]towards 3;3.RLYO.attach.DIST *Kika tied the ropes to one pole*. [EDSEI30NOV2017DRPM]

#### Narrow scope wrt universal Q subjects - MULT

- The plurality of events of dying cannot distribute over the plural domain of women introduced by the quantifier *cmajiic coi iij càap tazo cah* 'each of the women'
- (12)#Cmajiic coi iij càap tazo cah hacx yomiihtim. woman.PL DEF.PL apart SBJ.NMLZ:stand one DEF.FOC apart RLYO.die.MULT Int. Each of the women died (one after the other).
  - By contrast, the plurality of events can distribute of the plurality of women introduced by the definite description *cmajiic coi* 'the women'
- (13) Cmajiic coi hacx yomiihtolca. woman.PL DEF.PL apart RLYO.die.MULT/DIST.PL The women died (one after the other).

#### Narrow scope wrt universal Q subjects - DIST

- The quantifier *DP iij càap tazo cah* can multiply a singular indefinite
- (14)Cmajiic coi iii càap hahoot tazo cah 70 apart SBJ.NMLZ:stand woman PL DEF.PL one DEF.FOC door INDEF SG cöiyeemt. 3IO.3;3.RLYO.CAUS.open
  - Each of the women opened a (different) door.
  - But the plurality of events (required by DIST) cannot distribute over the (evaluation) plurality of doors

(15)# Cmajiic coi iij càap tazo cah hahoot zo woman.PL DEF.PL apart SBJ.NMLZ:stand one DEF.FOC door INDEF.SG cöiyeemla. 3IO.3:3.RLYO.CAUS.open.DIST

Int. Each of the women opened a (different) door.

SUMMARY	MULT	DIST
distribution required	time	(parts of) participant
distribution orientation	none	theme
scope wrt subject 'each of DP'	narrow	narrow
multiply indefinites	no	no

## Analysis and predictions

### Composing MULT forms

MULT(V) requires V to hold of at least two events whose sum is e

(16) 
$$[\![MULT]\!]^t = \lambda \mathsf{V}_{\langle s,t \rangle} \ \lambda \mathsf{e}_s. \ \mathsf{e} = \cup \{\mathsf{e}' | \ \mathsf{V}(\mathsf{e}') \ \& \ \mathsf{e}' \langle \mathsf{e} \ \& \ \mathsf{e}' \in \mathsf{Part}(\mathsf{e}) \}$$

- the V events e'
  - are proper parts of e along the time parameter
  - are members of the partition of e (i.e. sub-events of e do not overlap in time)
- a. Context: Yesterday María ate this orange segment-by-segment. Maria quih sahmees hipquij iyoohitim. Maria DET orange this 3;3.RLYO.eat.MULT María ate this orange.
  - b. Predicted truth-conditions
     [[S]]<sup>t</sup>= ∃e. e=∪{e'| eat(e') & e'<<sup>t</sup>e & e'∈Part(e)} & \*Theme(e)=this.orange
     & \*Agent(e)=Maria

There is a plural event e composed of at least two eating events which do not overlap on the temporal dimension, and the cumulative theme of e is this orange and the cumulative agent of e is Maria

- Like MULT(V),
  - DIST(V) requires V to hold of at least two events whose sum is e
  - the V events e' are proper parts of e along a contextually determined parameter k

(18) 
$$[DIST]^k = \lambda V_{\langle s,t \rangle} \lambda e_s. e = \cup \{e' | V(e') \& e' \langle e \& e' \in Part(e) \} \& \neg atom(*theme(e))$$

- Unlike MULT(V),
  - V events e' are members of the partition of e according to any parameter (i.e. sub-events of e do not overlap in at least one parameter of e)
  - the (cumulative) theme of e must not be atomic

#### Composing DIST forms – Part 2

- (19) a. Juan quih xiica an iqueeacalca coi hant iyootyax. Juan DET suitcases DET.PL land 3;3.RLYO.carry.DIST Juan carried the suitcases.
  - b. Predicted truth-conditions
    [S]<sup>k</sup>= ∃e.e=∪{e'| pull(e') & e'<<sup>k</sup>e & e'∈Part(e)} & ¬atom(\*theme(e)) & \*Theme(e)=the.suitcases & \*Agent(e)=Juan
    There is a plural event e composed of at least two pulling events which do not overlap in some dimension, and the cumulative theme of e is the suitcases and the cumulative agent of e is Juan
  - Pictures B: e is partitioned according to its theme dimension
  - Picture E: e is partitioned according to its temporal dimension



#### Composing DIST forms – Part 2



### DIST: plurality requirement on theme of plural event



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- It could be that the plurality requirement on events merely implies distinct theme (sub-)referents
- We have observed that as soon as speakers are fully aware of the unity of the suitcase referent in picture F, they tell us the sentence is a lie
- We have analyzed it for now as a requirement that the cumulative theme of the plural event be non-atomic
- But this could equally well be analyzed as a condition of non-certainty, with the unacceptability due to the plural DP xiica an iqueeacalca coi 'the suitcases' referring to a unique suitcase

- Gaps are one way to make clear where an event can be divided into sub-events along the time axis, but it's not the only way
- Other ways include
  - Changes in direction of motion

(21) Quisil quih xiica coquehelam quih iyoontim. SBJ.NMLZ.small DET balloon.PL DET 3;3.RLYO.hold.MULT The child held two balloons. [Questionnaire2FT4] SC: FALSE unless she is moving around the village with the balloons

Changes in intensity/degree

SITUACIÓN : LA NIÑA LLEVA 2. GLOBOS, UNO ON



### MULT and DIST can distribute to parts of participants

- MULT distributes events of building over times and parts of a house
- (22) Mike quih haaco z iyaaitim. Mike DET house INDEF.SG 3;3.RLYO.make.MULT Mike built a house (little-by-little). [EDSE126ABR2018DRPM]
  - DIST distributes events of opening to parts of a house, its doors and windows
- (23) Juan quih haaco cap cöiyeemla. Juan DET house DET.SG 3IO.3;3.RLYO.CAUS.open.DIST Juan opened (doors/windows in) the house. [Questionnaire2FT5]
  - NB: events can distribute to the material parts of an individual (Link 1983), i.e. doors/windows are not in the extension of the predicate *\*house*

# Interim Conclusion

SUMMARY	MULT	DIST
plurality req. on theme	no	yes
distribution required	time	(parts of) participant
distribution orientation	none	theme
dist. to m-parts allowed	yes	yes
gaps required	no	no
scope wrt subject 'each of DP'	narrow	narrow
multiply indefinites	no	no

- We analyze MULT/DIST as overt distributive operators (e.g. similar to adverbial *each* in Champollion 2016), to which we added:
  - plurality requirement on events
  - partition of events (instead of cover) to rule out overlap on at least one dimension (time for MULT, contextually determined k for DIST)
  - ▶ just for DIST: plurality requirement on theme of plural event e
- MULT/DIST apply at the V-level (not e.g. VP), this is why they do not multiply a sg indefinite object (under the view that arguments of the verb are introduced by theta-heads in the syntax)
- Theta-roles only get specified for the plural event e, not the singular events e': sub-events can be identified independently

## Returning to the Compositional Morphosemantics

Let's remind ourselves about our main semantic questions over and above questions of the truth conditions of MULT and DIST:

- What semantically grounds the "scale of plurality"—more pointedly, in what sense is a distributive pluractional with a singular subject "less plural" than a non-pluractional verb with a plural subject?
- Relatedly, why should plural agreement and pluractionality even be on the same scale?

And a huge compositional question with respect to the monotonicity hypothesis.

Let's remind ourselves that we have the following.

Scale of Plurality

Sg Neut « Sg Mult « Sg Dist « PI Neut « PI Mult (« PI Dist)

When we try to explain this hierarchy we run into lots of problems. Simple ideas tend to break down. Let's consider some.

We can understand fairly cleanly why DIST forms should rank over MULT forms, and both over NEUT Forms with a kind of "featural" account underpinned by model theoretic distinctions.

- The idea would be that DIST forms make two plural claims (events and individuals), while the MULT forms make one plural claim (events)
- NEUT forms make no plural claim (consistent with both plural and singular events), and so is entailed by the DIST and MULT forms.

Suppose *e* has MULT iff  $\neg$ **ATOM**( $\tau(e)$ ), where  $\tau$  is the temporal trace function

- When would an event have a temporal trace that is the sum of two temporal intervals?
- Assuming that traces are functional and that there is no such thing as collective temporal predication, then only when we have a plural event!

How then to handle DIST? Since it involves the theme, it would be natural to use the theme trace function just as we used the temporal trace function for MULT—i.e., *e* has DIST iff  $\neg$ **ATOM**(TH(*e*)), where TH is the theme trace function

- When would an event have a theme trace that is the sum of two individuals?
- When there are two different events, but also when there is collective predication!

But this is not enough! Collective predication is non-pluractional. We must also explicitly pluralize the event argument.

Thus, e has DIST iff  $\neg$ **ATOM**(TH(e)) and  $\neg$ **ATOM**(e)

- The result is that any event that satisfies DIST has a non-atomic event and a non-atomic individual argument.
- Which is more plural than verbs bearing MULT which only have a non-atomic event.
- And both are more plural than NEUT, which is consistent with a plural event, but does not require it.

But oh no! This logic means that

- DIST is more plural than PL because the former requires a plural event and a plural argument, but PL only requires a plural argument
- yet Sg DIST « PL NUET

What is the takeaway? We have to say something like:

- Plural agreement/Inflection is "more plural" than pluractional derivation (whether or not it recruits an individual argument)
- Or, Subject plurality is "more plural" than object plurality (which is "more plural" than unspecified argument plurality)

# Another stab (fancier!)

There is a growing literature arguing that plurality in the nominal domain is interpreted "high" and that plural morphology is not derivational, but agreement with those high features, which are presuppositions on denotations (e.g., Bale 2014; Bale 2021; Sauerland 2003; Sauerland, Anderssen, and Yatsushiro 2005).

- We can successfully analyze the Seri verbal stem system with two instances of this kind of high agreement, getting us the correct truth conditions, while at the same time predicting:
  - The scale of plurality
  - Other morphological facts (like the scarcity of 6th forms, especially relative to 5th forms)

First, though, we will look at high and low theories in the nominal domain.

#### Low theories

This (from Bale 2021) is probably what you think of when asked to think about what the plural means. It is also what we have been assuming for pluractionality.



In contrast, high theories argue that plural morphology is semantically vacuous. It is reflex of agreement with a higher head that places presuppositions on its complement.



There are many flavors of high theories depending on how high the plural/singular head applies and differing in the precise nature of the presuppositions involved.

In the flavor I want to extend to pluractionals, the PL/SG heads apply to XP-level constituents (which denote predicates), and bear type presuppositions in the style of Rothstein 2010.

(24) Type Presupposition:  $\llbracket \phi_{sg} \rrbracket$  is defined iff either (i)  $\llbracket NP \rrbracket$  is of type  $\langle e \times c, t \rangle$  and for each member of  $\langle x, c \rangle \in \llbracket NP \rrbracket$ , × counts as 1 in context *c*, or (ii)  $\llbracket NP \rrbracket$  is of type  $\langle e, t \rangle$ . When defined,  $\llbracket \phi_{sg} \rrbracket (\llbracket NP \rrbracket) = \llbracket NP \rrbracket$ .

The idea is that the plural bears no type presupposition. Then, in concert with Maximize Presupposition, we get the distribution of SG and PL in English nominals.

To handle the Seri data we need make further type distinctions. I propose that we must need to separate out the notions of countability and plurality.

- A plurality-context k<sub>p</sub> is the set of all non-atomic events/individuals in the context.
- A counting-context k<sub>c</sub> is a partial function provides a cardinality for each event/individual in the context.

I imagine that these can be further subdivided. That is a event plurality context just tells us which events are non-atomic, while a individual counting context tells us how to count individuals in the domain of type e.

- Note. Assuming atoms in a plurality context must have count 1 in a counting context means that a counting context is stronger than a plurality context. We can use the former to reconstruct the latter, but not vice-versa.
- We probably implement this in a lambda calculus with subtyping, which would be fun (and cleaner), but we won't here.

We noted the fact that counting contexts are stronger than simple plurality contexts because we can recover the latter from the former. This is the first step in defining an order over contexts.

If we further assume that, assuming the same amount of counting information, a context is stronger than another if there is more plurality information in the first than the second, we can provide a partial order over contexts.

In particular, we get the following order.



One piece of evidence for this is that a well-known feature of pluractionals is that is the normal, crosslinguistically, that pluractional events have unaccessible cardinalities. Schematically:

- "I hugged-PLRC the children three times" can only mean I did a pluractional hugging event three times, not that I did a single pluractional event that consists of a three hugging events.
- In this way pluractional events behave like mass nouns. That is, plural-like things that are not countable directly.
  - We can think of "times" in the adverbial as providing a classifier and counting context in order to count the events, just like measures, for instance, allow mass nouns to be countable.
  - Thus, pluractionals presuppose an event plurality context (k<sup>e</sup><sub>p</sub>), but not a event counting context (k<sup>e</sup><sub>c</sub>).

By separating counting contexts and plurality contexts, we have a foundation for understanding why subject plurality in Seri is "stronger plural" than the two pluractional derivations.

- Plural count individuals, the kind that trigger PL on Seri verbs, are, in fact countable. They require a counting context in a way
- In contrast, the plural events required by MULT/DIST are not countable. They only require weaker plurality contexts.
- (Don't forget that DIST also requires a plural object, but we'll come back to this)

#### Order of Composition



#### Warning

There are many ways of setting this analysis up. I am still not sure what is best, but here is a stab.

Let's make things explicit. We have 8 kinds of context  $(k_{ep}, k_{ec}, k_{\epsilon p}, k_{\epsilon c}, k_{ep,\epsilon p}, k_{ec,\epsilon p}, k_{ec,\epsilon c}, k_{ep,\epsilon c})$ . We take the various features features identified to contribute the following presuppositions.

- $\llbracket \phi_{PL} \rrbracket$  is defined iff  $\llbracket vP \rrbracket$  is of type  $\langle e \times c_{ec}, \ldots \rangle$  or stronger. When defined,  $\llbracket \phi_{PL}(vP) \rrbracket = \{x, k_{ec} \in \llbracket vP \rrbracket$  such that the cardinality of x > 1 in context  $k_{ec}\}$
- $\llbracket \phi_{MULT} \rrbracket$  is defined iff  $\llbracket VP \rrbracket$  is of type  $\langle \epsilon \times c_{\epsilon p}, \ldots \rangle$  or stronger. When defined,  $\llbracket \phi_{PL}(VP) \rrbracket = \{e, k_{\epsilon p} \in \llbracket VP \rrbracket | \neg atom(e) \text{ in context } k_{\epsilon p} \text{ and there are } e', e'' \le e \text{ such that } \tau(e') \neq \tau(e'') \}$
- ▶  $\llbracket \phi_{DIST} \rrbracket$  is defined iff  $\llbracket VP \rrbracket$  is of type  $\langle \epsilon \times c_{\epsilon p, ep}, \ldots \rangle$  or stronger. When defined,  $\llbracket \phi_{PL}(VP) \rrbracket = \{e, k_{\epsilon p, ep} \in \llbracket VP \rrbracket | \neg atom(e)$  in context  $k_{\epsilon p, ep}$  and  $\neg atom(th(e))$  in context  $k_{\epsilon p, ep} \}$
- $[\![\phi_{\text{SG/NEUT}}]\!]$  <- have no presuppositions and denote the identity function.
The presuppositions ensure that there is the minimal amount of plural background information in the context so that that the verb can be interpreted.

- NEUT and SG place no requirements on the context.
- MULT requires a  $k_{\epsilon p}$ , we must be able to determine when an event in plural.
- ▶ DIST requires a k<sub>ep,∈p</sub>, we must be able to determine when an event and its theme are plural.
- ▶ PL requires a *k<sub>ec</sub>*, we must be able to count individuals

Recalling our order from before, note that these are ordered by strength.

- DIST has more plural information than MULT.
- ▶ Both clearly have more than NEUT and SG, which have none.
- And PL bears the most plural information because counting means being able to recover plural individuals, but not vice-versa.

We now capture the scale of plurality in terms of semantic strength.

## Scale of Plurality

Sg Neut « Sg Mult « Sg Dist « PI Neut « PI Mult (« PI Dist)

## Scale of Plural Contexts

## $\varnothing \ll k_{\epsilon p} \ll k_{ep,\epsilon p} \ll k_{ec} \ll k_{ec,\epsilon p} (\ll k_{ep,\epsilon p,ec} = k_{ec,\epsilon p})$

Note that this last cell has redundancy: have an *ec* context means having all the information we have in an *ep* context and DIST doesn't add anything over having a PL feature.

The highlighted equivalence  $k_{ep,ep,ec} = k_{ec,ep}$  I believe, shows that the analysis is on the right track.

- It is very rare to have verbs that instantiate the 6th slot in the paradigm. Instead, PL forms that are also pluractional are just ambiguous between MULT and DIST readings.
- This is predicted by the fact that the simpler reduced form is just equivalent to the presupposition of MULT, namely requiring a k<sub>ec, cp</sub>.
  - Critically, DIST still has a different meaning then MULT, and more constituents end up being plural in a DIST PL scenario! It is just that in the context of PL, PL DIST presupposes nothing about the context over and above PL MULT.
  - If the morphology at issue is tracking these presuppositions, they should come together in this context.

In contrast, we do see DIST forms separate from MULT in the SG portion of the paradigm. This is once again predicted.

- There is, a distinction in the presupposition on the plural information available in the context when we move from MULT to DIST in SG.
- We gain information about the individual argument, i.e., MULT =  $k_{\epsilon p}$  « DIST  $k_{\epsilon p, ep}$