Reduplication in Yudja

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Goal of this paper
- Discuss the verbal reduplication/suppletion in Yudja in parallel to nominal pluralization;
- Argue that verbal reduplication and suppletion in Yudja are processes that can be analyzed as pluractional markers (Lasersohn 1995);

About Yudja
- Yudja is a language that belongs to Juruna family, Tupi stock. It is spoken by 294 people in Xingu Indigenous Territory in six villages (Kretire Antigo, Mupadá, Paksamba, Pequizal, Piaraçu and Tuba Tuba). Along with Yudja, two other languages belong to Juruna family: Xipaya (spoken by two people) and Manitsawá (extinct) (Rodrigues 1994; 96). Despite the small number of speakers, Yudja is not an endangered language if we consider that all children and adults speak fluently the language in their villages (Lima & Santos, ms., 2008).

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1 Background

Davidson (1967) event semantics

- Davidson (1967), Kratzer (1989): action sentences and stage-level predicates (Kratzer 1989) have an argument event:

1 The choir sang the Marseillaise.

2a \( \exists e \ [\text{SANG}(e, \text{The choir}, \text{the Marseillaise})] \)
2b \( \lambda y. \lambda x. \lambda e \ \text{SING}(x, y) \) (Rothstein 2001)

- If we assume Kratzer’s framework (2001;18), then subjects are not considered arguments of the verb, whereas objects are:

2c \( \lambda x. \lambda e \ \text{SING}(x)(e) \)

Cumulative

- Krifka (1992) has argued that simple predicates in natural language typically are cumulative. Cumulativity can be expressed by the denotation:

3 \( \forall x \forall y: [P(x) \& P(y)] \rightarrow P(x \oplus y) \)

- That is to say, a property \( P \) has cumulative reference if the sum of two objects in \( P \) is also \( P \).

4 Cumulativity (properties of individuals):
\( \lambda P_{\text{set}} \forall x \forall y \ [\ [P(x) \& P(y)] \rightarrow P(x \oplus y) \] \)
\( [[\sqrt{\text{child}}]] = \{ \text{Karin, Yaba, Aduaza, Maware, Karin+Yaba, Karin+Aduaza, Karin+Maware, Yaba+Aduaza, Yaba+Maware, Aduaza+Maware, Karin+Yaba+Aduaza+Maware} \} \)

5 Cumulativity (properties of events):
\( \lambda P_{\text{set}} \forall e \forall e' \ [\ [P(e) \& P(e')] \rightarrow P(e+e') \] \)
\( [[\sqrt{\text{sleep}}]] = \{ <\text{Karin, sleep}_1>, <\text{Yaba, sleep}_2>,..., <\text{Karin+Yaba, sleep}_1+\text{sleep}_2>, ... \} \) (Kratzer 2001; 3 – Chapter 4)

**Cumulativity Universal**
The denotations of simple predicates in natural languages are cumulative (Kratzer 2001; 2 – Chapter 4)
2 Nouns in Yudja

Bare arguments

- Bare nouns in Yudja can have more than one interpretation. In subject or object position, post- or pre-verbal, bare nouns can be interpreted as definite, indefinite, singular or plural (such as Mandarin, Cantonese, Thai and Dëne (Wilhelm 2008):

6 ali ba’ī ixu
child paca to eat
“The/a/child(ren) eat(s)/ate the/a paca(s)"
Literal: an unspecified number of children eat/ate an unspecified number of pacas in an unspecified number of events.

- Bare nouns are not only used in episodic sentences, but they can also have ‘kind’ and ‘generic’ readings:

7 kaniā urahu yahā Xingu he api’i mama
animal big/bigger rel. Xingu in dog big
‘The biggest animal of Xingu is the jaguar’

8 takum iduhau anu
mutum to dissapear asp
‘Mutums are in extinction’

9 Ka’apa apeta a anu
insect blood like asp
‘Insects like blood’

Plural

- Yudja has an optional plural morpheme {-i} restricted to [+ human] nouns (Fargetti 2001):

10a Senahī kota ixu
man snake eat
‘A/The man/men ate a/the snake(s)’

10b Senahī-i kota ixu
man-pl snake eat
‘(The) men ate a/the snake(s)’

10c kota senahī-i ixu
snake man-pl eat
‘(The) snake ate the men’
The example (10a) is ambiguous between an interpretation where a single man or more than one man ate the snake. In (10b) and (10c), the plural morpheme {-i} excludes the possibility of the interpretation ‘one single man’. (10d) and (10e) are ungrammatical because this morpheme is never associated to non-human nouns.

**Numerals**

- All nouns can be combined with numerals (nouns remain uninflected for number):

11  txabï'u  uda  apeta  wî
    three  someone  blood  bring
    ‘Someone brought three bloods’

12a Karin  meme  hinaku  ba'ë  apï
       Karin  one  paca  shot
       ‘Karin shot one paca’

12b Karin  yauda  ba'ë  apï
       Karin  two  paca  shot
       ‘Karin shot two pacas’

**Quantifiers**

- In Yudja, the quantifiers itxibï (many), urahu (much/big), xinaku (little/small), kïnana hinaku (few) can be combined with any noun, but the interpretation changes according to the quantifier and the quantified noun¹.

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¹ Milk (salt, sugar, fat, beans, water, blood, rice, corn, saliva)

ia  Itxibï  ahuanama  txa  ib  Kïnana hinaku  ahuanama  txa
    many  milk  few  milk
    ‘(There are) many containers of milk’  ‘(There are) few containers of milk’

ic  Urahu  ahuanama  txa  id  Xinaku ahuanama  txa
    much  milk  little  milk
    ‘(There is) a lot of milk in a single place’  ‘(There is) little milk in a single place’

iiia  Itxibï  ali  iib  Kïnana hinaku  ali
     many  child  few  child
     ‘(There are) many children’  ‘(There are) few children’
Summarization

i. Yudja is a number-neutral language (bare arguments, plural is optional and restricted to [+human] nouns), numerals do not require measure phrases or classifiers;

2 Verbs in Yudja

Basic properties

- Yudja verbs have few inflectional morphemes: (i) non-future and future morphemes (etxuka (I am eating, I ate), etxuka (I will eat)); (ii) causativization morphemes (for instance, ltxiaka (the cold weather) ija (water) i-na-txiaku (to make cold), ‘the cold weather made the water cold’); (iii) person agreement (ija (water) i-txiaku (got cold) ‘the water got cold’);

- Verbs in Yudja are by default unspecified for number of events:

  13 Yapariwa anĩ ba'ĩ apĩ
      Yapariwa that paca shoot
      “João shot at that paca”
      Literal: ‘João shot one single paca in an unspecified number of events’

  14 Karin itxibī Anana-be kamema kua
      Karin many Anana-dat necklace give.CUM
      “Karin gave many necklaces to Anana”
      Literal: Karin gave many necklaces to Anana in an unspecified number of times”

Reduplication & Suppletion

Compare 13/15:

  15 Yapariwa anĩ ba'ĩ apipĩ
      Yapariwa that paca shoot.RED
      “Yapariwa shot at that paca many times”
      * “Yapariwa shot at the pace once”

iic Urahu ali iid xinaku ali
   much/big child little/small child
   ‘The child is big’ ‘The child is small’
Compare 14/16:
16 Karin itxibī Anana-be kamema upiku
   Karin many Anana-dat necklace to give.PL
   “Karin gave many necklaces to Anana many times”
   *“Karin gave many necklaces to Anana once”

- The examples above show that verbs can reduplicate as in (15) or present a suppletive form as in (16) to denote multiple events.

- The ‘basic’ interpretation associated to reduplication is distributivity:

Distributive reading
17a Wi’ubia etu
   Tracajá egg fall
   ‘The egg(s) fell down’
   Literal: ‘an unspecified number of eggs fell down in an unspecified number of events’

17b Wi’ubia etutu
   Tracajá egg fall.RED
   ‘The egg(s) fell down’ (each one at a time)

- Verbal reduplication is one way to express habitual readings in Yudja (which is a type of distributivity):

18a João Maria du
   João Maria meet
   ‘João met Maria’
   Literal: ‘João met Maria in an undefined number of events’

18b João Maria dudu
   João Maria meet.RED
   ‘João always meets Maria’ (multiple events)

Iterative readings
19a Akayawī idjidaku
door hit/knock
   ‘(They) knocked the door’
   Literal: ‘they knock an unspecified number of doors in an unspecified number of events’
19b Akayawī idjidaidaku
door hit/knock.RED
‘(They) hit/knocked the door many times’

Together/Each readings

20a Maware Karin djuda pīza inānu
Maware Karin and boat lift
‘Maware and Karin lifted (an undefined number of) boat(s) together’
Literal: Maware and Karin lifted an unspecified number of boats in an
unspecified number of events together’

20b Maware Karin djuda pīza ināuinānu
Maware Karin and boat to lift.RED
‘Maware and Karin each lifted a boat in different events’ (ambiguous between
Maware and Karin each lift the same boat, or two different boats)

20c Maware Karin yauda pīza ināuinānu
Maware Karin two boat to lift.RED
‘Maware and Karin each lifted a different a boat in different events’
(necessarily two different boats are involved)

Note: that is the only way to express distributivity in Yudja. A distributive
quantifier such as each that is available in other Tupi languages, such as Karitiana, is
not available in Yudja.

Numerals

- The scope of numerals is never ambiguous in Yudja because when numerals
  quantify the event, they are followed by the morpheme {-ha}:

21a João yauda perumā zaku
João two monkey see
“João saw two monkeys” (undefined number of events)
# “João saw (an undefined number of) monkeys twice”

21b João yauda-ha perumā apī
João dois-adverb. monkey to see
“João saw (an undefined number of) monkeys twice”
# “João saw two monkeys (once/ many times)”

- Adverbalized numerals only quantify events otherwise the predicate is
  ungrammatical:
Quantifiers & Adjuncts

- Reduplication can co-occur with adverbs, habitual operators, and numerals:

**Habitual operator**
23 Maria e’ela’ela nana
   ‘Maria always dreams’

**Numerals**
24 Joao yaudaha kïkïhu
   Joao two.ADV fish.RED
   ‘Joao fished twice’

**Adverb and habitual operator**
25 Maria du e’ela’ela nana
   Maria always dream-red hab
   ‘Maria always dreams’

**Summarization**

- Non-reduplicated verbs are unspecified for number of events and type of event performed (collective, iterative, cumulative readings, etc);
- Numerals, when quantify events, need to be adverbialized by the morpheme {-ha};
- Reduplicated verbs and suppletive plural forms necessarily trigger distributivity;
- In the same way plural nouns can co-occur with numerals and quantifiers, reduplication can co-occur with adverbialized numerals, adverbs, habitual operators;

4 Theoretical implications

**Cumulativity**

- In Yudja, nouns do not present any piece of evidence in order to argue in favor of [singular], but instead we do have evidence to argue that all nouns are cumulative. To exemplify that, consider the following examples:

Scenario 1: I was in the school and Karin entered in the room looking for his gun to kill three pacas that were swimming in Xingu river. I asked Karin what was going on (because I saw people running) and he said:
Scenario 2: later this day, we were talking about pacas and I said that I like them because they are beautiful. Then, Karin remembers that Txapina also likes pacas and that he raised one as a dog. He said:

\[\text{Txapina ba’i imazu} \]

‘Txapina raised (the) paca’

- These two initial examples show that nouns in Yudja can denote a single individual (26) or many individuals (25) without any additional morphology for either case, i.e., these examples corroborates Kirfka proposal (1992) because the sum of \(ba’i_1 + ba’i_2\) in Yudja, keep being \(ba’i\).

- Kratzer (2001): predicates are cumulative from the start. Cumulativity is given at no cost for both nouns and verbs. In other words, in Yudja, lexical cumulativity can be consider the null hypothesis for any predicate (nominal or verbal) in the language (as Muller and Sanchez-Mendes proposed to Karitiana (2008));

Why is reduplication needed?

Verbal pluralization “exclude atomic events from the denotation of verbs” (cf. Ferreira 2005 for nouns and verbs, Muller 2000, Muller and Sanchez-Mendes 2008; 449)) nominal pluralization excludes atoms from the denotation of the nouns.

- In this perspective, pluractionality for verbs is equivalent for plurals in the nominal domain:

Verbal domain
Formalization (Muller and Sanchez-Mendes 2008; 450)

\[\begin{align*}
27a. \quad & \text{PL} = \lambda P \langle_{<_{<_{<>}>}} \rangle \lambda X \lambda E \left[ P(X)(E) \& \text{non-atomic (E)} \right] \\
& \quad \text{‘A function that takes a relation P between individuals and events and that returns the greatest subset of P whose members only contain non-atomic events’} \\
27b. \quad & \text{PL} = \lambda P \langle_{<_{<_{> >}}} \rangle \lambda E \left[ P(E) \& \text{non-atomic (E)} \right] \\
& \quad \text{‘A function that takes a property P of events and that returns the greatest subset of P whose members are only non-atomic events’}
\end{align*}\]

E: variable over cumulative events.

\[\begin{align*}
28a \quad \text{[\text{[sleep']]} = \{<\text{Karin, sleep1}, > <\text{Yaba, sleep2}, > <\text{Karin+Aduaza, sleep3}, > ..., <\text{Karin+Yaba,sleep1+sleep2}, > ..., <\text{Karin+Yaba+Aduaza, sleep1+sleep2+sleep3}, > ...\}}
\end{align*}\]
28b  \[ \text{PL ([[sleep]])} = \{<\text{Karin+Yaba, sleep1+sleep2}>, <\text{Karin+Yaba+Aduaza, sleep1+sleep2+sleep3}>, \ldots \} \]

Nominal domain
Formalization
29a  \[ [[\text{child}]] = \{\text{Karin, Yaba, Aduaza, Maware, Karin+Yaba, Karin+Aduaza, Karin+Maware, Yaba+Aduaza, Yaba+Maware, Aduaza+Maware, Karin+Yaba+Aduaza+Maware}\} \]

29b  \[ \text{PL} \ [[\text{child}]] = \{ \text{Karin+Yaba, Karin+Aduaza, Karin+Maware, Yaba+Aduaza, Yaba+Maware, Aduaza+Maware, Karin+Yaba+Aduaza+Maware} \} \]

Pluractional markers (Lasersohn (1995))

- Pluractional markers in Yudja are expressed by verbal reduplication and suppletion. These morphemes do not reflect the plurality of the verb’s arguments, but the plurality of the verb itself, because it is the verb that represents the occurrence of multiple events (Lasersohn 1995; 241). In Lasersohn’s own terms (1995; 240): “pluractional markers attach to the verb to indicate a multiplicity of actions, involving multiple participants, times or locations”

Lasersohn’s semantics for pluractional markers

- events in the set denoted by the pluractional verb have to separate running spaces, non-overlapping running times, or participants:

29a  \[ \text{V-PA}(X) \iff \forall e \in X[\text{P}(e)] \land \text{card}(X) \geq n^2 \]

‘\( X \) is in the denotation of V-PA iff for all event \( e \) that belongs to \( X \) \( e \) has the property \( P \) and the cardinality of \( X \) is at least as great as \( n \)’

(Lasersohn 1995; 256)

“(…) where \( n \) is fixed by a combination of lexical and pragmatic factors. To obtain a specifically distributive reading, we add a non-overlap condition”:

29b  \[ \text{V-PA}(X) \iff \forall e, e' \in X \ [\text{P}(e) \land \text{r f}(e) \land \text{f}(e')] \land \text{card}(X) \geq n \]

‘\( X \) is in the denotation of V-PA iff for all events \( e \) and \( e' \) in \( X \) \( e \) has a property and \( f(e) \) and \( f(e') \) do not overlap and the cardinality of \( X \) is at least as great

\[ ^2 \text{V: verb; PA: pluractional marker; e: variable over atomic events; n: variable over the natural numbers.} \]
as $n'$

(Lasersohn 1995; 256)

"the identity of $f$ determines whether the distributivity is temporal, spatio-temporal or participant-based":

Temporal: $f = \tau$
Spatio-temporal: $f = K$
Participant-based: $f = \theta$, where $\theta$ is a thematic relation assigned by $V$

"Separate" reading (betweenness clause is added):

$V$-$PA (X) \iff \forall e, e' \in X \ [ P(e) \land \neg f(e) \circ f(e') \land \exists e'' [\text{between}(x,f(e), f(e')) \land \neg \exists e''' [P(e'') \land t = f(e'')] ] \land \text{card}(X) \geq n$

'X is in the denotation of $V$-$PA$ iff for all events $e, e'$ in the denotation of $X$, $e$ has the property $P$ and $f(e)$ and $f(e')$ do not overlap and there is an $x$ between $f(e)$ and $f(e')$ and there is no $e''$ such that $e''$ has the property $P$ and $t$ equals $f(e'')$ and the cardinality of $x$ is at least as great as $n'"

Continuous reading (negate betweenness clause):

$V$-$PA (X) \iff \forall e, e' \in X \ [ P(e) \land \neg f(e) \circ f(e') \land \neg \exists e'' [\text{between}(x,f(e), f(e')) ] \land \text{card}(X) \geq n$

'X is in the denotation of $V$-$PA$ iff for all events $e, e'$ in the denotation of $X$, $e$ has the property $P$ and $f(e)$ and $f(e')$ do not overlap and there is not the case there is an $x$ between $f(e)$ and $f(e')$ and there is no $e''$ such that $e''$ has the property $P$ and $t$ equals $f(e'')$ and the cardinality of $x$ is at least as great as $n'"

Note: The identity of $P$ determiners whether we have a repetitive, or repeated action reading:

Repeated: $P = V$
Repetitive: $P$ is fixed lexically

- Because Yudja is a number-neutral language, a participant-based reading is possible if the noun in question is bare or plural (see example 6); if the noun is singular, a temporal or temporal-spatial reading is forced (see example 15).

Summarizing pluractional marker (PA) analysis:

i) This morpheme allows several readings including temporal reading (which is forced if the agent argument is singular) and participant-based reading;

ii) In all cases, multiple actions are necessarily implied; PA is incompatible with
situation where a single event was performed;

Final considerations

- In sum, in this presentation I argued in favor of a parallelism between the nominal and verbal domain concerning pluralization processes:

<table>
<thead>
<tr>
<th>PL_{nouns}</th>
<th>Plural_{event}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare nouns are cumulative</td>
<td>'Bare' verbs (non-reduplicated, not quantified) are cumulative</td>
</tr>
<tr>
<td>(unspecific for number of individuals, except when contextualized)</td>
<td>(unspecific for number of events, except when contextualized)</td>
</tr>
<tr>
<td>{i}, optional and restricted to [+human] nouns</td>
<td>Reduplication, suppletion</td>
</tr>
<tr>
<td>Modifies noun (N)</td>
<td>Modifies verb (V)</td>
</tr>
<tr>
<td>Function: exclude atoms from the denotation of nouns</td>
<td>Function: exclude atomic events from the denotation of verbs</td>
</tr>
<tr>
<td>Quantifiers and numerals take NP as an argument</td>
<td>Quantifiers, habitual operator, and numerals take VP as an argument</td>
</tr>
</tbody>
</table>

- I also argued that reduplication and suppletion are morphological manifestations of the pluractional operator that triggers distributive readings in the language;

References