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Pluractionality of Events in Macuxi: A Morpho-Syntactic and Semantic Analysis

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Abstract: This paper discusses how pluractionality is expressed in Macuxi (Cariban), a South American Indigenous language spoken in Brazil, Guyana and Venezuela. Cross-linguistically, the multiplicity of an action can be expressed by means of specialized pluractional morphemes affixed on verbs, via adverbs, or by reduplication. Previous work on Macuxi claimed that the iterative suffix *-pîtî* indicates a multiplicity of actions, whereas verbal reduplication is mentioned but scarcely described, and is associated with the interpretation of multiple events. Based on data from context-based elicitation, we show that verbal reduplication is impacted by *Aktionsart* (activity and semelfactive verbs, which denote unbounded, atelic events, have a higher tendency to be reduplicated) and that reduplicated verbs are often associated with an intensity interpretation. On the other hand, the suffix *-pîtî* functions as a pluractional marker that encodes a multiplicity of events and is predictable via a Lasersohnian analysis.

Keywords: pluractionality; reduplication; *Aktionsart*; Macuxi; Carib

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1. Introduction

This paper discusses how descriptions of a multiplicity of events are encoded in Macuxi (Cariban), a South American Indigenous language spoken in Brazil, Guyana and Venezuela. Cross-linguistically, several morphological strategies have been identified in the process of encoding a multiplicity of events, including affixation, vowel alternation and partial or full reduplication[1] (Cusic 1981; Lasersohn 1995; Xrakovskij 1997). In previous work on Macuxi (Carson 1982; Abbott 1991), it was claimed that the iterative suffix *-pîtî* (1) indicates a repetition of actions. In this literature, verbal reduplication (2) is mentioned but scarcely described, and is associated with the interpretation of multiple events.

1. *paapa* *yei* *ya'tî-pîtî*
   father-ERG tree cut-ITER
   "Father cuts the tree repeatedly." (Abbott 1991, p. 118)

2. *anî-patî-patî* *João-ya* *tuuke* *teeka*
   PRO-hit~hit Joao-ERG many time
   "Who has hit João often?" (Carson 1982, p. 180)

The multiplicity of actions or events has been treated with different terminology in the literature. Analogous to number in the nominal domain, distinguishing singularity and plurality, scholars have termed this as verbal number (Corbett 2000), event plurality, iterativity (Xrakovskij 1997), verbal plurality (Cusic 1981), or pluractionality (Newman 1980, 1990), which is the term we adopt in this paper. According to Lasersohn (1995), Mattiola (2019, 2020) and Wood (2007), pluractionality involves grammatical markers of

event plurality associated with the verb, and these markers express the repetition of events in time or space, or across various participants.

In this paper, we are particularly interested in the interaction between *Aktionsart* and pluractionality (Abdolhosseini et al. 2002; Yu 2003; Lima 2007; Wood 2007; Součková 2011; Cabredo-Hofherr and Laca 2012; Müller and Sanchez-Mendes 2020). More specifically, we explore whether the type of verb (see Table 1)[2] influences whether it can be reduplicated, as well as whether it is compatible with the morpheme *-pîtî*.

Table 1. Classes of verbs (Smith 1991, based on Vendler 1967).

	Static	Durative (Interval)	Telic/Bounded (Result)	Examples
Activity	–	+	–	run, push a cart
Accomplishment	–	+	+	build a house
Achievement	–	–	+	reach, find
Semelfactive	–	–	–	knock, cough
State	+	+	–	have, like

Activities are verbs unfolding over a measurable time span, with no inherent end point, e.g., "to run", while accomplishment verbs unfold over a measurable time span, with an end point, e.g., "to drown". Achievements are punctual verbs with a terminal point, e.g., "to find", while semelfactives are punctual verbs with no terminal point, e.g., "to knock". Lastly, static verbs have no internal change, e.g., "to like". This classification is useful, as it allows us to categorize verbs to distinguish finer differences between certain interpretations of plural events, considering their inherent temporal properties.

Across languages, *Aktionsart*, or the lexical aspect of the verb, affects readings of plural situations. For example, Abdolhosseini et al. (2002) found that, by considering the lexical aspectual classes and the semantics of base verbs in Niuean (Polynesian), they could predict the meaning of a given reduplicated verb. Based on the patterns observed in cross-linguistic studies and formal approaches to this topic (such as Lasersohn (1995), discussed in Section 4), this paper aims to expand on previous descriptions of this topic in Macuxi (Abbott 1991; Carson 1982; Grund 2017) and address the following questions: what is the difference in the distribution and interpretation of the morpheme *-pîtî* and reduplication in Macuxi? Does *Aktionsart* have an impact on whether verbs can be reduplicated and on whether verbs can suffixed with the morpheme *-pîtî*? Finally, what are the interpretations of reduplicated verbs, and for verbs with the *-pîtî* suffix?

This paper is organized as follows. In Section 2, we present a brief overview of the Macuxi language. Section 3 introduces the tasks performed with Macuxi speakers to investigate the distribution and interpretation of the morpheme *-pîtî* and reduplication in Macuxi. Section 4 presents a formal analysis of both phenomena in the language, based on Lasersohn (1995), Součková (2011), and the literature on *Aktionsart*. Finally, Section 5 presents the results of this study against the typology of Cariban languages, based on the work of Mattiola (2019).

2. The Macuxi Language

The Macuxi language (ISO 639-1: mbc; Cariban), also referred to as Makushi, Makushí, Makuchi, Makussi, Makusi, Pemon, Teweya, or Teueia in the literature, is spoken in the northern Brazilian state of Roraima, the Rupununi region of Guyana and the Bolívar state of Venezuela. According to the Macuxi entry in Instituto Socioambiental's Encyclopedia of Indigenous Peoples in Brazil (Santilli 2018), the Macuxi population is estimated at 43,192, with 33,603 in Brazil (as of 2014), 9500 in Guyana (as of 2001) and 89 in Venezuela (as of 2011).

Macuxi belongs to the Cariban family, sharing similarities with other languages in the east–west geographic–linguistic group proposed by Durbin (1977), including Pemong (Taurepang), Akawaio and Arekuna (Crevels 2012, p. 183).

Some Morphosyntactic Aspects of the Macuxi Language

Previous literature has diverged regarding Macuxi's basic word order. While some authors claimed that the basic word order is OVS (Abbott 1991; Derbyshire and Pullum 1981; Pullum 1981), other authors claim that the basic word order is SOV (Carson 1982). Typologically, Gildea (1998) also acknowledges these discrepancies, and classifies Macuxi under the "Progressive" system, with a nominative word order: [OV]A/VS.[3] Abbott (1991) hypothesizes that Carson's postulation about the SOV word ordering in Macuxi could be an effect from working with bilingual speakers of Portuguese, which has a word order in which the subject appears first. Both Carson and Abbott also attribute the variation in Macuxi word order to discourse pragmatics, where a subject can be fronted for emphasis.

Carson and Abbott describe Macuxi as having an ergative–absolutive system, in which the ergative suffix *-ya* occurs on transitive subjects such as *yenupanen*, "teacher", presented in (3), and on pronouns when they encode the subject of transitive verbs, such as *to-* in (4).

3. *more-yamî* *yenupa-'pî* *to'* *yenupa-nen-ya*
   child-PL teach-PST their teach-S:NOMLZR-ERG
   "Their teacher taught the children." (Abbott 1991, p. 83)

4. *mîîkîrî* *yarî-'pî* *to-'ya*
   3:PRO carry-PST 3:PRO:PL-ERG
   "They carried him." (Abbott 1991, p. 25)

Macuxi verbs are marked for person and number, aspect, and mode via affixes. The general Macuxi verb template is shown in Table 2.

Table 2. Macuxi verb template.

prefix-	verbal stem	-aspect	-tense	-suffix	-number
i	ii	iii	iv	v	vi

Macuxi has a prefix (i) that agrees in person with the subjects of intransitive verbs and the objects of transitive verbs. This is followed by the verbal stem (ii), before the subsequent suffix (iii), which tends to be an aspectual marker. Abbott (1991) lists such markers as follows: completed action (*-sa'*), iterative (*-pîtî*), reversative (*-ka*), procrastinated action (*-tu'ka*), conative (*-yonpa*), ingressive (*-pia'tî*), and terminative (*-aretî-ka*). Tense-marking (iv) occurs after the presence of any aspectual marking. This is followed by a suffix for case (v): the ergative *-ya* is used with the subject of transitive verbs. The final possible suffix in the verbal template (vi) is for number agreement, such as with the collective suffix *-kon*.[4]

In this paper, we focus on the distribution and interpretation of the suffix *-pîtî* and reduplication. As previously mentioned, the *-pîtî* suffix (Abbott 1991), also characterized as an iterative morpheme (Carson 1982), occurs immediately after the verbal stem (5) and before the completed aspect or past tense (6). According to Abbott, it expresses repeated or habitual action, when occurring with *-ʔpɨ*, "past". For instance, Abbott describes (6) as only interpretable as a habitual action of worshipping in the past.

5. *a:-koʔ man-pɨtɨ* *mɨrɨrɨ*
   3-remain-ITER there
   "He is still living there." (Abbott 1991, p. 118)

6. *mîîkîrî* *i-n-koneka-'pî* *yapurî-pîtî-pî* *to'ya*
   3.PRO 3-OBJ.NMLZ-make-PST praise-ITER-PST 3.PRO.PL-ERG
   "They used to worship that which he made." (Abbott 1991, p. 118)

Abbott (1991, p. 34) highlights the existence of "verb repetition" and describes this process as a grammatical strategy that indicates the continuativity of an event, occurring over a period of time or distance. We refer to this phenomenon as verbal reduplication[5]. For instance, in (7), the verb for "to go" is reduplicated in order to indicate a continuative, repetitive action, as is the verb for "to remain" in (8).

7.	*moropai*	***attî-'pî***	***attî-'pî***	***attî-'pî***	*a'nai*	*tîrî-'pî*	*see pata*	*e'ma ta*
	and	**go-PST**	**go-PST**	**go-PST**	corn	put-PST	this place	road in
		e'ma ta	*e'ma ta*					
		road in	road in					

"And he went and went putting corn here in the road (as he went along)."
(Abbott 1991, p. 34)

8.	*moro*	***aa-ko'mamî-'pî***	***aa-ko'mamî-'pî***	*t-ekkari*	*t-onpa-i*
	there	**3-remain-PST**	**3-remain-PST**	3:REFLX-food	3:REFLX-taste-ADVBLZR
		pra	*asakî'n*	*e wei*	
		NEG	two	day	

"There he remained, not eating his food for two days." (Abbott 1991, p. 34)

Carson's (1982) grammar further illustrates verbal reduplication. In (9), the verbal stem *patî* occurs twice. This example is not contextualized, and from the translation, the interpretation of the reduplicated verb is unclear. Additionally, the use of the adverb *tuuke teeka*, "number of times, often", is compatible with the interpretation of the verb indicating a repetition of events:

9.	*anï-**patï-patï***	*João-ya*	*tuuke*	*teeka*[6]
	PRO-**hit~hit**	Joao-ERG	many	time

"Who has hit João often?" (Carson 1982, p. 180)

Beyond the examples found in the existing grammars, there is a lack of in-depth descriptions of the use and possible interpretations of reduplication in Macuxi. In her ethnographic study on the movements of Macuxi people along the southern Guyana border, Grund (2017) discusses the use of reduplication in her consultants' narratives. Drawing links to verbal art and poetic discourse, Grund observes that reduplication seems to be very common in descriptions of movement in Macuxi, and that this construction is associated with intensity, habituality and continuative action (Grund 2017, pp. 204–5, based on Sherzer 2002, pp. 19–21).

In Section 3, we discuss the strategies employed in context-based elicitation sessions to investigate the distribution and interpretations of reduplicated verbs and of the *-pîtî* suffix.

3. Pluractionality Questionnaire: Investigating Reduplicated Verbs and the *-pîtî* Suffix

3.1. Materials and Methods

We made use of a questionnaire designed to explore how *Aktionsart* and number of events (single or multiple) influenced the distribution of the *-pîtî* suffix and reduplication. Elicitation sessions were conducted with two Macuxi consultants, in Boa Vista, Roraima, Brazil, in May 2019.

Below, we describe the three tasks of the Pluractionality Questionnaire, along with their results: (i) a translation task; (ii) grammaticality judgment tasks; (iii) truth value judgment tasks (Antono 2020).

3.2. Translation Task

The first section of the Pluractionality Questionnaire involves the translation of verbs, which were chosen based on their classification according to *Aktionsart* (lexical aspect) (Table 3). Since this classification was based on English verbs, we were not certain whether verbs can indeed be classified in the same way in Macuxi. This nevertheless provided us with a starting point to observe patterns in the behaviour of Macuxi verbs. Forty-eight verbs were translated in the present study.

Table 3. Classes of verbs (Smith 1991).

Activities	Accomplishments	Achievements	Semelfactives	States
run	build a house	break	hit	know
walk	cook a meal	notice	jump	believe
swim	paint a picture	recognise	cough	love
push	draw a picture	find	tap	think

After translating each verb, consultants were also asked to translate sentences with different subjects (first-, second-, third-person singular, and first-, second-, and third-person plural).

3.3. Grammaticality Judgment Task

In this task, consultants were presented with sentences with reduplicated forms of the verbs translated in the first task. They were also presented with non-reduplicated verbs suffixed with *-pîtî*, and they were asked to evaluate whether the sentence containing that verb would be acceptable. Thirty-nine verbs were tested in this task[7]. These were broken down into *activity* (eight verbs), *accomplishment* (thirteen verbs), *achievement* (nine verbs) and *semelfactive* (nine verbs) in the results. For the purposes of this study, we chose to focus on dynamic, non-stative verbs, in order to focus on the notions of telicity (boundedness) and durativity. A summary of the results presented in this task was previously presented in Antono (2020).

Results: Grammaticality Judgment Task (Antono 2020)

The results of this task suggest that there is an effect of *Aktionsart* on the acceptability of verb reduplication.

As Table 4 shows, activity and semelfactive verbs seem more likely to accept reduplication than achievements and accomplishments. For all the verbs that were reduplicated, not only the verb root, but also the inflectional morphology for tense was reduplicated. Consider examples (10), (11) and (12):

Table 4. Reduplication: results of grammaticality judgment task for each verb class.

Verb Class (*Aktionsart*)	Verbs That Could Be Reduplicated	Verbs That Could Not Be Reduplicated
Activity (eight verbs tested)	*run*, *swim*, *talk*, *cry*, *push*	*walk*, *scold*, *sleep*
Accomplishment (thirteen verbs tested)	*build*, *paint*, *clean*	*plant*, *wash*, *cook*, *write*, *clean (wash)*, *eat (meal)*, *eat (sweets and fruits)*, *give*, *send*, *fish*
Achievement (nine verbs tested)	*ya'mirika* "break" (for one speaker)	*lift*, *carry (multiple items)*, *carry (one item)*, *fall (person)*, *fall (tree/person)*, *fall (from above)*, *fall (generic)*, *throw.*
Semelfactive (nine verbs tested)	*hit/knock*, *jump*, *laugh*, *lick*, *cough*	*brush*, *cut/saw*, *flicker*, *clap*

10. a. *João* *eka'temî-pî* *komampara*
João run-PST yesterday
João ran yesterday.
b. *João* *eka'temî-pî~eka'temî-pî* *komampara*
João run-PST ~run-PST yesterday
João ran a lot yesterday.

(Activity)

11. a. *João-ya* *mana'ta* *pa'tî-pî.*
João-ERG door hit-PST
João knocked on the door.
b. *João-ya* *mana'ta* *pa'tî-pî~pa'tî-pî*
João-ERG door hit-PST~hit-PST
João knocked on the door many times.

(Semelfactive)

12. a. *João-ya* *uutî* *ikoneka-pî.*
João-ERG house build-PST
João built a house.
b. *João-ya* *uutî* *ikoneka-pî~ikoneka-pî*
João-ERG house build-PST~build-PST
João built a house (intensely).

(Accomplishment)

Notably, the reduplication of accomplishment and achievement verbs were marginally accepted. These verbs (as in (12b) and (13b)) are most likely incompatible with reduplication and are only marginally accepted in very marked scenarios involving intensity. For instance, only one of the two speakers consulted accepted the construction in (13b). This speaker suggested that one could reduplicate the verb if there is intense emotion involved, such as rage or anger. The same holds for (12b).

13. a. *João-ya* *îinî* *ya'mirika-pî.*
João-ERG pan break-PST
João broke the pan.
b. *João-ya* *îinî* *ya'mirika-pî~ya'mirika-pî*
João-ERG pan break-PST~ break-PST
João broke the pan (intensely).

(Achievement)

The copying of inflectional morphemes alongside the stem is unusual, as it is cross-linguistically more common for languages to involve partial reduplication (e.g., the copying of syllables or feet) and/or full reduplication (e.g., the copying of a root, stem or word) (Rubino 2005). Reduplication of verbal stems and inflectional morphemes, while uncommon, can be observed in Bantu languages (including Kikerewe (Odden 1996) and Kuria (Mwita 2008)) and in English reduplicative structures for contrastive focus (Ghomeshi et al. 2004).

Unlike constructions with reduplicated verbs, the distribution of *-pîtî* does not seem to be influenced by *Aktionsart*. Consider Table 5.

Table 5. *Pîtî:* Results of grammaticality judgment task per verb class.

Verb Class	**Compatibility with *pîtî***	**Incompatible with *pîtî***
Activity (eight verbs tested)	*run*, *push*, *talk*, *walk*, *scold* and *sleep*	*swim* and *cry*
Accomplishment (thirteen verbs tested)	All verbs tested.	N/A
Achievement (nine verbs tested)	All verbs tested.	N/A
Semelfactive (nine verbs tested)	All verbs tested.	N/A

In all sentences in which the verb is marked with *-pîtî*, the interpretation encoded is that of a multiplicity of events, regardless of the verb class:

14. a. *João* *we'na-pî* *(ipîra)*
João sleep-PST much
João slept (a lot).
b. *João* *we'na-pîtî-pî* *(ipîra)*
João sleep-ITER-PST much
João slept many times (a lot).

(Activity)

15. a. *Komampara* *João-ya* *utîî* *kuima-pî*
Yesterday João-ERG house clean-PST
João cleaned the house yesterday.
b. *Komampara* *João-ya* *utîî* *kuima-pîtî-pî*
Yesterday João-ERG house clean-ITER-PST
João cleaned the house repeatedly yesterday.

(Accomplishment)

16. a. *João* *tarema-pî*
João fall-PST
João fell.
b. *João* *tarema-pîtî-pî*
João fall-ITER-PST
João fell repeatedly.

(Achievement)

17. a. *João-ya* *yei* *ya'tî-pî*
João-ERG tree cut-PST
João cut the tree.
b. *João-ya* *yei* *ya'tî-pîtî-pî*
João-ERG tree cut-ITER-PST
João cut the tree repeatedly.

(Semelfactive)

In sum, the results of the grammaticality judgment task show that there is an interaction between *Aktionsart* and reduplication in Macuxi. Activity (five out of eight) and semelfactive (five out of nine) verbs seem more likely to accept reduplication than other classes of verbs: achievements (one out of nine) and accomplishments (three out of ten). Conversely, *Aktionsart* does not seem to influence the distribution of the *-pîtî* suffix: six out of eight activity verbs, all thirteen accomplishment verbs, all nine achievement verbs, and all nine semelfactives can be suffixed with *pîtî.*

The translations provided by the speakers in this task suggest that the suffix *-pîtî* and reduplication have different functions in the language: while *-pîtî* is clearly associated with a multiplicity of events, reduplication seems to often be associated with intensity. Since translations should be taken only as cues and not as the best diagnostic of how sentences are interpreted, this activity was followed up with a truth value judgment task, presented below.

3.4. Truth Value Judgment Task

In the truth value judgment task, we explored the possible interpretations of sentences that contained reduplicated verbs, and those that contained a verb suffixed with the *-pîtî* morpheme[8]. The consultants were provided with an overarching context, supplemented with pictures. The contexts were set up to explore whether the consultants accepted reduplicated verbs or verbs suffixed with the *-pîtî* morpheme in specific scenarios in which multiple events took place.

Results: Truth Value Judgment Task

The results confirm that the *-pîtî* suffix can be used in scenarios where multiple events take place. In (18), the context provided involved a man who carries chairs across a room multiple times. While *-pîtî* was compatible with this context (18a, 18b), a reduplicated verb was not (18c):

18. Context: João is carrying chairs across the room multiple times.
a. *João-ya* *aponno* *yanunmî-pîtî-pî*
João-ERG chair lift-ITER-PST
João lifted (various) chairs (to move them to a different location).
b. *Sîrîrîpe* *João-ya* *aponno* *yanunmî-pîtî-pî*
today João-ERG chair lift-ITER-PST
João lifted (various) chairs (to move them to a different location) today.
c. **João-ya* *aponno* *yanunmî-pî~yanunmî-pî*
João-ERG chair lift-PST~lift-PST
Intended: João lifted (various) chairs (to move them to a different location).

The same pattern was observed in (19), in which a man is writing the same type of letter (same content), multiple times, to be sent to different people. Only a verb suffixed

with the *-pîtî* morpheme was accepted in this context (19a), while a reduplicated verb was not (19b):

19. Context: João is writing a letter (repeatedly): the same letter for multiple people.
    a. *João-ya* *mîrîrî* *maikon* *manuka'-pîtî-pî* *mia'taikin* *kaareta po'*
    João-ERG same words write-ITER-PST five letter
    João wrote the same words for five letters.
    b. **João-ya* *mîrîrî* *maikon* *manuka'-pî~manuka'-pî* *mia'taikin* *kaareta po'*
    João-ERG same words write-PST~write-PST five letter
    Intended: João wrote the same words for five letters.

In Abbott's grammar, the *-pîtî* morpheme is said to be associated with only the habitual reading when it co-occurs with the past tense affix, *-pî*. The results of our task suggest that *-pîtî* and *-pî* can occur in contexts in which the multiple events are not habitual, as exemplified in (18b). The grammaticality judgment tasks revealed that the *-pîtî* suffix is accepted across different verb classes. The interpretations associated with this morpheme were confirmed to be associated with distribution over time, as described previously (Abbott 1991; Carson 1982; Amódio and Pira 2007). A new observation, contrary to that posited by Abbott (1991), is that the *-pîtî* morpheme can co-occur with the past tense, *-pî*, in situations with multiple events that are non-habitual (18b).

Verb reduplication is acceptable in contexts in which intensity is conveyed by the context:

20. Context: João and Maria are in a relationship; João has to travel without Maria, which makes her upset (non-habitual repeated action).
    komampra *Maria* *karawa-pî~karawa-pî* *João* *wîttî-pî* *wenai*
    yesterday Maria cry-PST~cry-PST João go-PST because
    Yesterday Maria cried and cried because João left.

The interpretations associated with each construction need not be mutually exclusive: reduplication forces an intensity reading, while *-pîtî* is associated with a cardinality of events. A combination of the two constructions might be associated with contexts with intense, multiple, individuable events, which was attested in our elicitations:

21. *João* *tausin'pasa'* *arapun-pîtî~arapun-pîtî*
    João happiness jump-ITER ~jump-ITER
    João jumps vigorously many times with joy.

22. *João* *tausin'pasa'* *arapun-pîtî-pî~arapun-pîtî-pî*
    João happiness jump-ITER-PST ~jump-ITER-PST
    João jumped vigorously many times with joy.

Considering these patterns and the possible interpretations associated with these two constructions, we now turn to a formal analysis.

4. A Formal Analysis of Macuxi Pluractionals

4.1. An Analysis of pîtî

We have seen in the previous sections that the multiplicity of events in Macuxi can be expressed via the *-pîtî* morpheme. In this section, we provide an analysis of this morpheme in light of Lasersohn's account of pluractionality (Lasersohn 1995). According to Lasersohn, pluractional markers are morphemes which "attach to the verb to indicate a multiplicity of actions, whether involving multiple participants, times, or locations. Pluractional markers do not reflect the plurality of a verb's arguments so much as the plurality of the verb itself" (Lasersohn 1995, pp. 240–41). Given its distribution and interpretation, we analyze *-pîtî* as a pluractional marker.

Under Lasersohn's analysis, a verb affixed with a pluractional marker would be interpreted as in (23):

23. $\text{V-PA(X)} \Leftrightarrow \forall e, e' \in X[V(e) \,\&\, \neg\tau(e) \circ \tau(e')] \,\&$
$\exists t[(\text{between}(t, \tau(e), \tau(e')) \,\&\, \neg\exists(e'')[V(e'') \,\&\, t = \tau(e'')]) \,\&\, \text{card}(X) \geq n$

A pluractional verb is true of a group of events X, if and only if there are at least *n* events in X, and every event *e* in X holds true of the corresponding "singular" verb V, does not overlap with any other event *e′* in X, and is separated from *e′* by an interval *t* such that no other event of type V occurs at *t*.

We now extend this analysis to Macuxi. Consider example (24):

24. Context: Maria washed three shirts: one shirt in the morning, one in the afternoon and one in the evening.

Maria-ya	*pon*	*runa-pîtî-pî*
Maria-ERG	shirt	wash-ITER-PST

Maria washed shirts (repeatedly).

25. runa-PA(X) $\Leftrightarrow \forall e, e' \in X[\text{runa}(e) \,\&\, \neg\tau(e)\ o\ \tau(e')] \,\&$
$\exists t[(\text{between}(t, \tau(e), \tau(e')) \,\&\, \neg\exists(e'')[\text{runa}(e'') \,\&\, t = \tau(e'')]) \,\&\, \text{card}(X) \geq n$

(25) states that runa-PA is true of X if and only if there are at least *n* events in X, and every event *e* in X is an event of washing that does not overlap with any other event *e′* in X, and is separated from *e′* by some interval *t*, such that no washing occurs at *t*.

4.2. An Analysis of Reduplicated Verbs

Lasersohn's proposal, based on the event/phase and the distributivity parameters from Cusic (1981), works for the interpretations of the *-pîtî* morpheme, as the event is distributed over time. However, its application to Macuxi reduplication is more complicated. While compatible with situations with multiple events (as suggested by the speakers' translations and previous work on this topic), reduplication is generally associated with the intensity interpretation rather than the cardinality of events, as seen with the *-pîtî* morpheme.

The issue with Lasersohn's analysis is the lack of tools with which to account for intensity interpretations. An anonymous reviewer recommended that we adopt Součková and Buba's (2008) revision of Lasersohn (1995) for Hausa pluractionals to account for the intensity interpretations associated with Macuxi reduplication. In their approach, the semantics of pluractionals contain a degree component, which replaces the cardinality component in Lasersohn's formalization. Another key difference is in the treatment of verbs: whereas simple verbs refer to singular events in Lasersohn's analysis, Součková and Buba treat simple verbs as number-neutral, such that they can refer to either singular or plural events. Separately, pluractional verbs can only refer to plural events.

In Hausa, pluractionality is marked via partial reduplication of the verb, and it can be used to express a plural event in which sub-events are distributed across participants, locations, or times (Součková and Buba 2008, p. 135). Crucially, this ideally involves a vague and high number of participants, locations, or times. This is a productive derivational process that applies to all verbs, albeit with varying acceptability judgments from speakers. However, Součková and Buba focus on a specific subset of Hausa pluractionals, gradable verbs, which when reduplicated, generate intensity interpretations, as opposed to the prototypical distributive interpretations. These gradable verbs are mostly intransitives, as in (26).

26.

a.	naa/mun	gàji
	1SG/1PL.PF	be_tired
	"I am / we are tired"	
b.	mun	gàg-gàji
	1PL.PF	RED-be_tired
	"We are all very tired"	
c.	#naa	gàg-gàji
	1SG.PF	RED-be_tired
	Intended reading: "I am very tired"	

(Součková and Buba 2008, p. 137)

Based on these data, the authors modify Lasersohn's proposal, replacing card(X) $\geq$ n with a degree component. The degree function allows access to larger sums of events from the verbal denotation. Furthermore, this function would encapsulate the vagueness of the number value. In Součková and Buba's view, the denotation of a pluractional morpheme is as follows (Součková and Buba 2008, p. 140):

27. [[PA]] = λVλe.V(e) & e$\notin${At} & ∀e',e'' ⊂ e [V(e') & V(e'') & ¬f(e') o f(e'') & ∃x[between(x,f(e'),f(e'')) & ¬∃e''' [V(e''') & x = f(e''')]] & ∃d_h[(d_h(V))(e)]
d_h . . . degree function mapping an ordered set to a subset of it that contains all those elements that qualify as relatively high with respect to the given ordering.

This allows them to expand the coverage of the analysis and account for both plurality and intensiveness, as in (28b).

28. a. yaa / yâraa sun ruuɗèe
3SG.PF / children 3PL.PF be.confused
He was / (the children were) confused.

b. yâraa sun rur-rùuɗèe
hildren 3PL.PF RED-be.confused
The children were very confused (beyond control, alarmed). (intensive)

c. * yaa rur-ruuɗèe
3SG.PF RED-be.confused
Intended interpretation: He is very confused.

(Součková and Buba 2008, p. 137)

The core of Součková and Buba's analysis is that the semantics of pluractionals in Hausa encode a degree component, which account for the "high degree" readings. While we agree that some form of degree component and vagueness might be necessary to account for the intensification interpretation, we are hesitant to adopt this analysis for Macuxi, as it centers gradability as a core component in interpreting multiple events. The reduplication in Macuxi appears to be distinct from the mostly intransitive, gradable cases in Hausa, especially since only a subset of Macuxi verbs allow reduplication. Furthermore, the intensification effect that arises with reduplicated verbs is supplementary to the multiplicity of events. Instead, we adopt Součková's subsequent revision (Součková 2011) of this approach, in which the meanings of pluractional Hausa constructions are attributed to interactions between different levels of meaning: (a) the core meanings of pluractional verbs (e.g., event plurality); (b) event anchoring (e.g., how a given language individuates events); and (c) "special" meanings of event plurality.

We analyze the intensification effect of Macuxi reduplication as an additional, "special" meaning. Součková (2011) provides several pieces of evidence that intensification is a peripheral (i.e., non-core) meaning that can potentially arise with a Hausa pluractional. Firstly, while the plurality meaning cannot be cancelled, the intensification interpretation can be cancelled for some speakers. Secondly, the intensification effect extends beyond gradable verbs (the basis of Součková and Buba's (2008) analysis), as in (29). As opposed to degree modification, Součková posits that cases like (29) involve an emphasis on events that are marked ("an implication that the event was somehow more 'serious' or 'abnormal' in some way" (Součková 2011, p. 192)).

29. a. Naa tòokàree shi
1SG.PF / poke him
"I poked him."
N.B. It can be gentle

b. Naa tàt-tòokàree shi
1SG.PF / RED-poke him
"I poked him."
N.B. %repeatedly and with strength

(Součková 2011, p. 192)

In sum, we adopt Součková's approach to pluractional meaning by positing reduplication as an additional, "special" component of event plurality, in addition to the semantic contributions of the *-pîtî* morpheme. This is especially significant considering the limited verbs that permit reduplication in Macuxi, which we will now address.

4.3. A Commentary on the Aktionsart Effect on Acceptability of Reduplicated Verbs

In Section 3, we showed that Macuxi semelfactives and activities tend to be reduplicated more than the other classes of verbs, and that reduplication is often found to encode the intensity of events.

Recall that we focused on two factors for the dynamic verbs in the translation task: telicity and durativity (Table 1). A bounded or telic event has a natural end point. A durative event unfolds over a measurable time span, whereas a punctual event occurs in an instant. It should be noted here that we adopt the definition of semelfactives from Smith (1991). Smith posits semelfactives as a distinct category, arguing that they are atelic achievements[9] that occur instantaneously.

Semelfactives and activities are atelic verbs with no inherent end points. In (30), we observe the reduplication of the activity verb *etuka*, "push". The verb *push* has no inherent end point, and it would be difficult to individuate these acts of pushing, considering that there is no change of state in this context. Reduplication with an intensity reading is thus plausible.

30. Context: João tried to enter the house, but the door wouldn't move.

João-ya	*mana'ta*	*etuka-pî~etuka-pî*
João-ERG	door	push-PST~push-PST

João pushed the door vigorously.

Considering that intensity characterizes unbounded events, it would be logical for these two classes of verbs (semelfactives and activities) to accept reduplication more readily than achievements and accomplishments. This pattern was indeed revealed in our results. In other words, these unbounded events, which are less likely to be able to be counted, make use of reduplication as a measuring strategy.

4.4. A Note on the Syntax of Macuxi Pluractionals

The Macuxi data point to two potential positions where they are generated in the syntax. A syntactic analysis would need to account for several factors: (i) *-pîtî* being universally acceptable across verbal classes and (ii) the reduplication of semelfactive and activity verbs being more likely than that of achievements and accomplishments.

Scholars have hypothesized that event structure (i.e., thematic and aspectual requirements) is syntactically encoded (Travis 2010; Borer 2005; Ramchand 2008). Borer (2005), for instance, posits that Aktionsart is derived via functional structure, considering that verbal roots themselves do not encode aspectual information. Travis (2010) posits that Aspect is positioned between two VP shells, and that there are two possible layers for aspectual morphology. Syntactic analyses of pluractionality in various languages have built on these proposals, such as in Mandarin (Sinitic) (Basciano and Melloni 2017) and Ranmo (Papuan) (Lee 2016). Ranmo similarly exhibits two strategies for pluractionality (verb alternation and suffixation), and Aktionsart exerts an influence on which verb alternations can give rise to pluractional readings. Lee draws on the framework in Travis (2010) to provide a syntactic account, positing a low Aspect head of the feature [+/− bounded] to account for verbal root alternations.

In a similar vein, it might be tempting to presume that Macuxi reduplication occurs lower in the syntax ("Inner Aspect"), due to the telicity constraints. The Macuxi data cited in prior sections demonstrated that innately telic verbs cannot be reduplicated. Crucially, Macuxi verbs must possess the features [+dynamic] and [−telic] to be reduplicated. Conversely, we could posit that the *-pîtî* morpheme is positioned in the higher AspP in the tree, since it is less sensitive to the [± telic] feature. However, a third factor to account is the co-occurrence of reduplication of a verb suffixed with *-pîtî* (21), as well as the possible redu-

plication of the verbal stem and inflectional morphemes (e.g., the tense markers) (22). This might suggest that reduplication perhaps occurs higher in the syntactic tree post-suffixation. We leave a formal syntactic analysis of these two pluractional strategies for future work.

5. Macuxi and Beyond: Pluractionality in the Cariban Family

In the previous sections, we observed how multiple events are encoded in Macuxi through the *-pîtî* morpheme, while reduplication tends to be associated with the intensity of an action, and less with a multiplicity of events. These strategies in fact share similarities with pluractional strategies found in other languages in the Cariban family.

We conclude by discussing how the cognates of *-pîtî* surface in other Cariban languages. This construction has been described as the most widespread pluractional strategy across the Cariban family. Focusing on the Akawaio *-pödï* morpheme, Mattiola (2019) describes it as sharing the same semantic functions as similar morphemes that occur in other Cariban languages, including Macuxi, Carib and Panare. These suffixes are cognates that may share the same diachronic origin. Mattiola (2019) discusses these cognates of **-pëtï*, drawing a connection to at least the Venezuelan branch of the Cariban family, summarized in Table 6.

Table 6. Summary of **-pëtï* cognates (Mattiola 2019, pp. 107–8).

	Orthography
Macuxi	*-pîtî*
Akawaio	*-pödï*
Carib (Guianan)	*-poty*
Kari'nja (Carib of Surinam)	*-potï*
Panare	*-pëtï*

The functions of these morphemes across these languages appear to overlap across different branches. In Carib (Guianan), the suffix *-poty* has been described as encoding iterativity, frequentativity (31), habituality and spatial distributivity (32) (Courtz 2008, p. 82; Mattiola 2019, p. 107). This also surfaces in Ye'kwana as *-jötï*, and shares similar functions of iterativity and frequentativity (Cáceres 2011).

31. *y-(w)yto-ry* *ta* *y-jámun* *ky-ni-ase-tyka-**poty**-jan-no* *wara*
1-go-POSSC in 1-body ALLEG-AEO-RXC-shock-**ITER**-PRSU-ADN like
"As I went, my body seemed to shiver continually, as it were."

32. *w-(w)yto-**poty**-ja* *te* *pàporo* *moro-kon* *pakira*
IM-go-ITER-PRS but all that-PL collared-peccary
ase-kupi-tòkon *warano*
RXC-bathe-NIPL at_every_instance_of
"But I went to all the places where peccaries bathe."

In his typological study, Mattiola proposes a conceptual space of pluractionality, which we have adapted for Macuxi in Figure 1 (based on a case study on Akawaio). In Mattiola's map, the functions on the left side are likely to be constructions that (a) are not grammaticalized, (b) fall farther out from the core functions of pluractionality and (c) rely heavily on *Aktionsart*. The *-pîtî* morpheme and its associated core functions, as discussed in previous sections, are circled in orange in the center of the conceptual map. We also include the other constructions encoding different pluractional functions, using red for the continuative and green for participant plurality functions. While there is no mention or discussion of the interpretation of intensity in the other Cariban languages in Mattiola's typology, the intensity function of reduplication in Macuxi may be placed on the left side of the conceptual map (in purple). Mattiola's placement of intensity as a secondary function, external to the core pluractional functions of event plurality (e.g., iterativity), is parallel

to the treatment of intensification as a "special", additional meaning in Součková (2011), which we adopted in this paper.

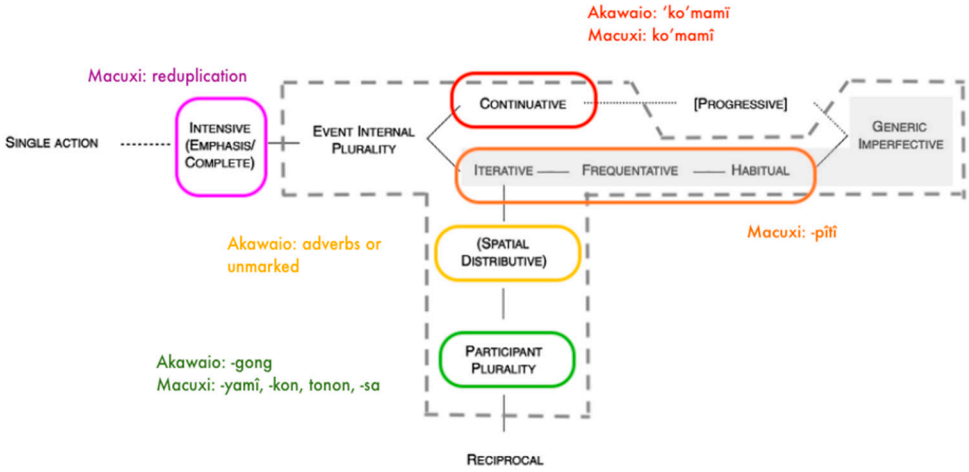

Figure 1. Charting the functions of pluractional strategies in Macuxi, based on an adaptation of Mattiola's (2019) conceptual map of the Akawaio *-pödï.*

6. Concluding Remarks

The present study explored the form and functions of two constructions in Macuxi: the *-pîtî* morpheme and reduplication. The distribution and interpretation of these two constructions suggest that while *-pîtî* is specifically able to encode multiple, individuable events, reduplication is primarily associated with a dimension of measurement other than cardinality: intensity.

Through the analysis of data from context-based elicitations, our findings suggest that *-pîtî* is a main, grammaticalized, pluractional strategy, applicable to verbs across the different *Aktionsarten*. We confirmed that the functions of the *-pîtî* morpheme allow the distribution of events over a period of time. Crucially, while this morpheme has been described in the literature as only encoding habitual events when it co-occurs with the past tense *-pî* (Abbott 1991), we found that non-habitual, multiple events are also compatible with their co-occurrence. In addition, we argued that these functions of the *-pîtî* morpheme can be predicted with Lasersohn's (1995) proposal with respect to the distribution of events over time. Based on this analysis, it is possible to predict both habitual and non-habitual multiple events, distributed over time. We also showed that the form and function of the Macuxi *-pîtî* mirrors that of a cognate, *-pödï*, in Akawaio, a neighboring Cariban language, as discussed in Section 5.

Regarding reduplication, we showed that this phenomenon is associated with a secondary function (i.e., intensification), which is influenced by *Aktionsart*: semelfactive and activity verbs tend to be reduplicated, while achievements and accomplishments are less likely to accept reduplication. In Section 4, we showed how Lasersohn's (1995) formalization is inadequate in accounting for the function of the intensity associated with reduplicated verbs. We adopt an approach from Součková (2011) in treating Macuxi's two strategies of pluractionality as two semi-independent components. Reduplication and its associated "special" intensification function should be treated differently, especially considering its limitations, based on *Aktionsart*. Considering that atelic verbs, such as activities and semelfactives, were more likely to be reduplicated, we can associate this with the notion that these verbs denote actions that are not as easily individuable as telic events. Rather than being associated with a cardinality of events or *counting* events, reduplication can be said to be associated with *measuring* events instead, based on a different dimension, such as intensity. Similarly, intensity is classified as a secondary, additional function of pluractionality in Mattiola's (2019, p. 36) typology, defined as one that encodes "a situation done with more effort or whose result is augmented with respect to the normal happening

of the same situation". Therefore, we suggested that reduplication and this intensity function in Macuxi could potentially be placed on the left side of Mattiola's semantic map, which is also associated with a reliance on *Aktionsart*.

In sum, this paper provides an analysis of different strategies for counting a multiplicity of events (via the *-pîtî* suffix) and measuring events (via reduplication) by reconciling formal analyses of pluractionality, *Aktionsart* and conceptual maps.

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Abbreviations

The following abbreviations are present in this manuscript:

3	Third person
ADN	Adnominalizer
ADVBLZR	Adverbializer
AEO	Absence of explicit object
ALLEG	Allegation
ERG	Ergative case
ITER	Iterative aspect
OBJ.NOMLZR	Object nominalizer
NIPL	Instrument nominalization plural
PL	Plural
POSSC	Controlled possession
PRS	Present
PRSU	Tense present uncertain
PRO	Pronoun
PST	Past tense
RED	Reduplication
REFLX	Reflexive
RXC	Reflexive
SG	Singular
S:NOMLZR	Subject nominalizer

Notes

[1] Many authors have observed that reduplicated structures involve a non-arbitrary form–meaning relation: a reduplicated construction entails an additional meaning on top of the semantics of its base (Pott 1862; Moravcsik 1978; amongst many others). In their work on Caribbean Creole languages, Kouwenberg and LaCharité (2011) summarized these observations via *The Iconic Principle of Reduplication*, which stipulates that "more of the same form stands for more of the same meaning".

[2] Durativity refers to an action occurring over a measurable time span, where verbs can be durative or punctual. Telicity refers to whether there is an inherent end point. A third factor, stativity, concerns whether a change of state occurs during an event.

These Vendlerian classes of eventualities (with the later addition of *semelfactives*) rely on these parameters, and are summarized in Table 1 (Vendler 1967; Smith 1991).

[3] According to Gildea (1998, p. 23), other closely related Cariban languages fall under the same classification for word order: Pemón (also known as Taurepang or Arekuna) and Kapón (aka Akawaio) share the Progressive system, as seen in Macuxi. Some of the distinct features of this system are the nominative word order and the lack of case marking.

[4] Macuxi pronouns simultaneously surface as free morphemes or affixes, notably with (a) inclusive and exclusive third-person-plural distinctions and (b) various deictic forms for third-person-singular and -plural pronouns (Abbott 1991, p. 99). These are mutually exclusive when used. In the absence of free morphemes, for subjects, number agreement in Macuxi surfaces in the form of suffixation in transitive verbs. Direct objects and intransitive subjects are marked with a verbal prefix. The collective suffix *-kon* applies to plural subjects and/or objects, except for cases in (a) third-person plural and (b) first-person-plural exclusive.

[5] Macuxi also has ideophones (Abbott 1991, p. 149), which, according to Abbott, "denote the action normally expressed by a finite verb form". These ideophones are not inflected, and tend to feature reduplicated sequences (i). Since we focus on verbal reduplication and its associated interpretations, we leave this aside for future work.

i. *mîrîrî* *pî'* *to'* *wanî-'pî.* *tîren, tîren, tîren,* *pîratu* *pa'tî-'pî* *to'-ya.*
that at 3:PRO:PL be-PST sound:of:spoons:and:plates plates hit-PST 3:PRO-PL-ERG
"They were at that (doing that). Banging of plates and spoons, they hit the plates." (Abbott 1991, p. 149)

[6] Carson (1982, p. 180) glossed *tuuke teeka* as *often* and described this verb as being able to encode "number of times, often". Given that we know that the words *tuuke* and *teeka* can be translated as *many* and *time*, respectively, we have reglossed this example.

[7] A list of these verbs can be found in the Supplementary Materials.

[8] In future studies, we will explore how the number of core arguments interacts with reduplication and the suffix *-pîtî.*

[9] A possible argument, however, can be made against the properties of semelfactives as a class of verbs. Rothstein (2004) argues that semelfactives are, in fact, telic, and that they are unable to denote (near-) instantaneous events. While Smith posits that achievements involve a change of state that does not occur in semelfactives, Rothstein argues that semelfactive events comprise further subevents that can be considered changes of state. An example of such an internal structure is the action of winking, which consists of shutting and opening the eye.

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