ON DISTRIBUTIVITY IN KARITIANA[*]

Ana Müller & Esmeralda V. Negrão

anamuler@usp.br; www.fflch.usp.br/dl/anamuller

evnegrao@usp.br

University of São Paulo, Brazil

I. Introduction

Karitiana is the sole surviving language of the Arikém family (Tupi Stock), and is currently spoken by approximately 330 people living on a demarcated Indian reservation 95 kilometres from Porto Velho, capital of the state of Rondônia, in the Northwest of Brazil (cf. Storto & van der Velden 2005).

This paper focuses on the expression of distributivity in Karitiana. More specifically, it investigates the syntax and semantics of distributive numerals in the language. From a broader perspective, the paper aims at assessing the implications of the semantics of distributive numerals in Karitiana for semantic theories on the expression plurality and distributivity in natural languages.

There are many languages, from a broad array of distinct language families, that express distribution by the use of distributive numerals. Some examples are: Maricopa (Hokan, spoken in Arizona), Gã (Niger-Congo, spoken in Ghana), Bura (Afro-Asiatic, spoken in Nigeria), Nubian (Nilo-Saharan, spoken in Egypt), Rumanian (Indo-European), Turkish (Altaic), Tagalog (Austronesian, spoken in Philippines), Japanese, and Georgian (South Caucasian) (cf. Gil 1995).

Cross-linguistically distributive numerals are frequently formed by the use of reduplication (cf. Gil 1982, 1995). That is so for Karitiana. In Karitiana, distributive numerals are reduplicated numerals, as illustrated in (1) and (2). This paper tackles the

following questions: (i) what is the semantics of reduplicated numerals in Karitiana?; (ii) what is the syntax of reduplicated numerals in the language?

(1) <u>Contexts</u>: Each child built one canoe./ Children built one canoe a day/a week/a month. [1]

Myhint	myhint	nakam'at		gooj	õwã[2]
myhin-t	myhin-t	Ø-naka-m-'a-t		gooj	õwã
one-OBL	one-OBL	3-DECL-CAUS-build-NFT		canoe	child

'Children built canoes distributively (in ones)'[3]

(2) <u>Contexts</u>: Each child built two canoes./ Children built two canoes a day/a week/a month.

Sypomp	sypomp	nakam'at		gooj	õwã
sypom-t	sypom-t	Ø-naka-m-'a-t		gooj	õwã
two-OBL	two-OBL	3-DECL-CAUS-build-NFT		canoe	child

'Children built canoes distributively (in twos)'

We claim that distributive numerals are adverbial pluractional operators - they pluralize the event argument and impose a homogeneity restriction on it. This means that sentence (1) could be paraphrased as (3). What distributive numerals do, then, is pluralize the event argument of the predicate.

(3)   'There was a canoe building event by children and this event can be divided into atomic subevents of children building canoes',

---

[1] The data is presented as follows: 1st line: context; 2nd line: orthographic transcription of the Karitiana sentence; 3rd line: morphological segmentation; 4th line: morpheme by morpheme gloss; 5th line: translation. The symbols used are the following: NFT= non future, AUX = auxiliary, RDPL = reduplication, DECL = declarative, IRR = irrealis, IMP = imperative, 1s = 1st person singular agreement, 2s = 2nd person singular agreement, 3 = 3rd person agreement, 3p = 3rd person, OBL = oblique, CAUS = causative, VERB = verbalizer, ASST=assertive, OFC = object focus, POS = posposition, SUB = subordinator, TV = thematic vowel. We chose to separate the translation from the context. In the context we present the situation supplied to the informant.

[2] Karitiana has two tenses, future and non-future. We translated all sentences as past in order to simplify our discussion. This option does not interfere with the issues under discussion.

[3] We will consistently translate Karitiana nouns to Enlish bare plurals. Nevertheless, it is important to bear in mind that they are number-neutral and can refer to both atomic and plural individuals. They are also unmarked to the definite-indefinite distinction.

> where: the atomic subevents are individualized on the basis of participants or 'times'.

The data presented and discussed in this paper was obtained by one of the authors by means of controlled elicitation unless otherwise indicated. Moreover, the research carried out for elaborating this paper also involved the analysis and discussion of the data obtained by other researchers by means of both spontaneous speech and controlled elicitation.[4] This particular investigation, an analysis of the syntax and semantics of distributive numerals in Karitiana, requires detailed structural paradigms which correspond to controlled discourse contexts, whose adequacy or even truthfulness the speaker has to judge. We therefore proceeded as follows: the native consultant was provided with a context and was asked how he would convey a specific Portuguese meaning in his own language. Once the sentence was produced in the target language, we double-checked its adequacy in other contexts. For a more detailed account of the methodology adopted, the reader is referred to Matthewson 2004.

The paper is organized as follows. Section II below presents the theoretical background on which our analysis is based. Section III presents the relevant facts about Karitiana grammar. In section IV, we discuss how cumulative, collective and distributive readings are generated by cumulative denotations of verbs and nouns. In section V, we discuss the expression of distributivity in Karitiana. Next, in section VI, we present our analysis of distributive numerals as plural operators over the VP. In section VII, we provide evidence in support of our analysis. Finally, section VIII concludes with a summary of our claim and of its consequences.

II. **Theoretical Framework**

---

[4] The first researchers to work on Karitiana were David Landin and Rachel Landin who described the syntax and the phonology of the language (Landin, D. (1983), (1984), (1988); Landin, R. (1982), (1987), (1989); Landin & Landin (1973)). Subsequently we have had the works of Daniel Everett ((1985), (1993a), (1993b), (1994)). Luciana Storto – who has been working on the description and analysis of the language since 1992 – analysed phonetic/ phonological and syntactic aspects in her Ph.D. dissertation, 1999 and published various articles on the language and on its phonology and syntax (Storto (1993), (1994), (1995), (1997a), (1997b), (1998a), (1998b), (2000), (2001), (2002a), (2002b), (2003), (2004), Storto & Baldi (1994), Storto & Demolin (2002), (2003a), (2003b), (2004)). Besides these works there is also Caleb Everett's dissertation (Everett (2005)). Work on the semantics of Karitiana includes the following: Coutinho-Silva (2005), Müller et al. (2006), Sanchez-Mendes (2006) and Sanchez-Mendes & Müller (2007).

In this section we present the theoretical premises of the current analysis. Our investigation takes event semantics as a starting point – i.e., it assumes that verbs take an event argument (cf. Davidson 1967, Parsons 1990, Schein 1993, Lasersohn 1995, among others). More specifically, we adopt Kratzer's proposal that verbs can only take one argument besides the event argument – the internal argument (cf. Kratzer 2003). The subject is not considered to be a real argument of the verb, but a predicate which is introduced via the theta-relation to the sentence by a functional constituent, such as is possibly the case with voice. Therefore any semantic operation on verbal denotations will only affect the event argument and the internal argument, if there is one.

In this model, a sentence such as (4) corresponds to the logical form in (5), whose meaning can be paraphrased as, "There is an event e such that Inácio is the agent of e and e is the event of lifting Nádia".

(4)   Inácio lifted Nádia.
(5) $\exists e$ [**agent** (Inácio)(e) & **lift** (Nádia)(e)]

Kratzer (2003) also assumes that denotations of verb phrases (VPs) are minimal. This means that verb phrases denote events, in which nothing other than that which is expressed by the lexical meaning of verb and object (if there is one) occurs. For example, the verb phrase *lift Nádia* in (4) denotes an event in which nothing other than the lifting of Nádia occurs. So that no other child can participate, no table can be lifted, nor can any other entity or event take part in this event. Crucially, minimal events can be plural events though.

Another premise put forth by Kratzer (2003, 2005) is the Cumulativity Universal, which postulates that in natural languages, simple predicate denotations are always cumulative (cf. Krifka 1992, Landmann 1996). A predicate is cumulative if whenever it applies to two individuals it also applies to their sum. A classical example is the nominal plural. If Maria and João are students and Carlos and Andrea are students, then Maria and João and Carlos and Andrea are students. That is, any sum of students belongs to the denotation of *students*. The same pattern can be used to illustrate verbal cumulativity: if e an event of *lifting Nádia* and *e'* is another event of *lifting Nádia*, then *e+e'* is also an event of *lifting Nádia*.

The definition of cumulativity for nominal predicates is presented below in (6) and illustrated in (7) by the nominal root √*student*. The definition in (6) states that a nominal predicate is cumulative if, and only if, for any two entities to which it can be applied, this predicate can also be applied to the two entities considered as a plurality. The definition of cumulativity for verbal predicates is presented in (8) and illustrated in (9) by the transitive verbal root √*lift* (cf. Kratzer 2003). Just as with nouns, (8) states that a verbal predicate is cumulative if, and only if, for any two events to which it can be applied, it can also be applied to the two events considered as a plurality.

(6)   Cumulativity (of nouns):
         A nominal predicate P is cumulative if, and only if, for every individual x and every individual y, if sentence P(x) is true and sentence P(y) is true, then sentence P(x+y) is true[5].

(7)   [[√student]] = {Maria, João,…, Maria+João,…, Maria+João+Carlos, ... Maria+João+Carlos+Andrea,... }

(8)   Cumulativity (of verbs):
         A verbal predicate P is cumulative if, and only if, for every event e and every event e', if P is true of e and P is true of e', then P is true of $e+e'$. [6]

(9)   [[√lift]] = {<Maria, e_1>, <João, e_2>,…, <Maria+João, e_1+e_2>,…}

Therefore intransitive verbal roots denote both plural and singular events. When verbal roots are transitive or ergative they denote relations between singular and/ or plural events and singular and/ or plural entities. As mentioned above, the reason for this is that in Kratzer's 2003 model, intransitive verbs do not take an internal argument, while transitive and ergative verbs only take an internal argument.

---

[5] Formal definition: $\lambda P\langle et\rangle \forall x \forall y$ [[P(x) & P(y)] $\rightarrow$ P(x+y)], where: P: variable over predicates, x,y: variables over entities (cf Kratzer 2003).
[6] Formal definition: $\lambda P\langle st\rangle \forall e \forall e'$ [[P(e) & P(e')] $\rightarrow$ P(e+e')], where: P: variable over predicates, e,e': variables over events (cf. Kratzer 2003).

Having presented the theoretical background, we move to briefly present the facts of Karitiana grammar that are relevant to our discussion.

III. About Karitiana

In this section, we present some facts about the grammar of Karitiana that will give the reader enough context to understand our examples. Karitiana is a verb-final language, which features obligatory movement of the main verb to the second position in matrix clauses. There is a complementary distribution between matrix clauses and subordinate clauses with respect to the position of the verb. In most cases, declarative matrix clauses have the verb in the second position (SVO, OVS), as in sentence (10). Embedded causes, however, are always verb-final, as in the embedded clause of sentence (11).

(10)　　Taso　naka'yt　　　　　boroja

　　　　taso　Ø-naka-'y-t　　　　boroja

　　　　man　3-DECL-eat- NFT　　snake

　　　　'A/the some man/men ate a/the/some snake(s)'

(11)　　[Taso　õwã　mangataty]　　　　ytapyting　　　　　yn

　　　　[taso　õwã　mangat-a-ty]　　　y-ta-pyting-Ø　　　yn

　　　　man　child　lift-TV-OBL　　　　1s-DECL- want-NFT　I

　　　　'I want men to lift children'

Verb movement in matrix clauses seems to be associated with the presence of agreement and tense, which are always absent from dependent clauses (cf. Storto 1999, 2003). Although NPs are not marked for case in Karitiana, the language displays an ergative-absolutive case pattern, which shows up in verbal agreement: intransitive verbs agree with their subjects, whereas transitive verbs agree with their direct objects (cf. Storto 1999). This pattern is illustrated by the contrast between agreement in intransitive sentences such as (12) and (14) and the transitive sentences such as (13) and (15).

(12)　　Atara!　　　　　　　　　　　　　　　　Storto 1999

　　　　A-tar-a

2s-go- IMP

'(you) Go away! '

(13) An ioky! Storto 1999

An i-oky-Ø

2s 3-kill-IMP

'(you) Kill it!'

(14) Ataopisot an Storto 1999

a-ta-opiso-t an

2s-DECL-listen-NFT you

'You listened' (intransitive)

(15) An ytaokyt yn Storto 1999

an y-ta-oky-t yn

2s 1s- DECL-hurt- NFT I

'You will hurt me'

Constituent order supports the analysis of Karitiana as a verb-final language: complements precede pospositions in Pospositional Phrases, as illustrated in (16); possessors precede possessed within the Noun Phrase (NPs), as illustrated in (17), and subordinate clauses precede main clauses, as illustrated in (18). The ergative-absolutive morphological pattern, the absence of tense in subordinate clauses and the complement-head order are general characteristics of the Tupi stock languages (cf. Storto 1999).

(16)

Sete de Setembro	tyym	atakatari	hotel	pip	Storto 1999
Sete de Setembro	tyym	a-taka-tar-i	hotel	pi-p	
Sete de Setembro	POS	2s-DECL-go-IRR	hotel	place- POS	

'You will get to the hotel through Sete de Setembro (avenue)'

(17) a. ysypy'et Storto 1999

y-sypy'et

1s-uncle

'My uncle'

b.   Inacio carro

        Inacio car

        'Inacio's car'

(18)   [Yn   opiso] atakakãrãt   an   Storto 1999

        [yn   opiso] a-taka-kãrã-t   an

        I   listen 2s-DECL-think-NFT you

        'You thought that I listened'

Karitiana Noun Phrases always occur bare. There are no overt functional morphemes within the nominal system. There are no articles, determiner quantifiers, numeral classifiers or number morphology within the NP. The array of possible readings for sentence (19) illustrates this fact. Verbs, on the other hand, may be marked for number by the use of reduplicated affixes, as illustrated by sentences (20a,b).

(19)   Taso naka'yt   boroja

        taso   ∅-naka-'y-t   boroja

        man   3-DECL-eat-NFT   snake

        'A/the some man/men ate a/the/some snake(s)'

(20)   a.   <u>Context</u>: A boy broke two eggs at once (one event only).

    Õwã   nakakot   sypomp   opokakosypi.

    õwã   ∅-naka-kot-∅   sypom-t   opok-ako-sypi

    child   3-DECL-break-NFT two-OBL   egg

    'Children broke two eggs/ Children broke eggs twice'

    b.   <u>Context</u>: A boy broke two eggs, one after the other (more than one event).

    Õwã   nakokonat   sypomp   opokakosypi.

õwã	∅-na-kot-kot-a-t	sypom-t	opok-ako-sypi
child	3-DECL-break-RDPL-VT-NFT	two-OBL	egg

'Children broke two eggs/ Children broke eggs twice'

Having presented the relevant characteristics of Karitiana grammar, we proceed to the discussion of collective, cumulative and distributive readings of its sentences.

IV. Cumulative, Collective and Distributive Readings in Karitiana

This section aims at teasing apart cumulative, collective and distributive readings of sentences such as (21) in Karitiana. All these readings are claimed to be generated by the lexical cumulativity of its verbs and nouns.

(21) Õwã   nakam'at   gooj
      õwã   ∅-naka-m-'a-t   gooj
      child 3-DECL-CAUS-build-NFT   canoe
      'Children built canoes'

<u>Paraphrase</u>: *There is a possibly plural event in which a possibly plural number of children built a possibly plural number of canoes*.

We assume that the Cumulative Universal is true of nouns and verbs in Karitiana when they enter syntactic structure, and before they are operated upon by any functional heads. Since NPs always occur bare in Karitiana, lexically cumulative nouns remain cumulative throughout syntactic derivation (cf. Müller et al 2006). Verbs may be pluralized by reduplicated affixes, but even when they are pluralized, their denotations remain cumulative throughout syntactic derivation (Müller & Sanchez-Mendes 2008). This predicts that Karitiana sentences that have not undergone number operations, such as the use of numerals or distributive operators, will have an array of possible readings as a consequence of the lexical cumulativity of its nouns and verbs.

Sentence (21) above illustrates the fact that Noun Phrases (NPs) and Verb Phrases (VPs) have cumulative denotations in Karitiana. Sentence (21) is neutral as to the number of events and entities involved in the situation described by the sentence. The sentence *Õwã nakam'at gooj* holds true of any number of events in which any number

of children built any number of canoes. This interpretation is formally represented in (22).[7] The sentence, and its logical representation, holds true of situations which may be called (i) cumulative: boys building canoes in various possible combinations; (ii) collective: a group of boys building a group of canoes together; and (iii) distributive: each boy building one canoe, or each boy building two canoes, etc..

(22) $\exists E \exists X \exists Y$ [**build** (Y) (E) & **agent**(X)(E) & **child**(X) & **canoe**(Y)],

<u>where</u>: E is a variable over singular and plural events, and X and Y are variables over singular and plural entities.

Assuming that **build, child, canoe** are cumulative predicates and **agent** is a cumulative relation, the logical representation in (22) accounts for the fact that sentence (21) holds true of an array of situations such as, for example: (i) a unique child building a single canoe; (ii) a group of children building a single canoe; (iii) one child building some canoes; (iv) each child building a canoe; and many others.

In order to illustrate our claim, we will create three situations: a cumulative situation, a collective situation and a distributive situation. We will then proceed to show that the fact that sentence (21) comes out true in all of the three situations is a result of lexical cumulativity. Table 1 illustrates a possible cumulative situation in which three girls – Ana, Bia and Cris - build canoes. Ana and Bia build each one canoe, and the three girls together build another canoe.

<u>Table 1</u>: situation 1 - cumulative

Agent	Theme	Event
Ana	Canoe1	e1
Bia	Canoe2	e2
Ana+Bia+Cris	Canoe3	e3

The logical representation in (23), attributed to the sentence *Õwã nakam'at gooj,* holds true of situation 1. This result can be grasped by examining the corresponding cumulative denotations of the predicates involved. Capital letters stand for the names of

---

[7] The logical representation in (13) leaves out the interpretation of the functional morphemes NFT, CAUS, DECL for the sake of simplicity. They bear no relevance to the claim being made.

the girls, e_n stands for events, and c_n stands for canoes. Situation 1 is properly described by the denotations in bold. In other words, the attribution of the values in (24) to the variables X, Y and E in (22) make sentence (21) true.

(23)

[[**child**]] =   {A, B, C, A+B, A+C, B+C, **A+B+C**}

[[**canoe**]] =   {c1, c2, c3, c1+c2, c2+c3, c1+c3, **c1+c2+c3**}

[[**agent**]]=   {<A,e1>,<B,e2>,<A+B+C,e3>,<A+B,e1+e2>,..., **<A+B+C, e1+e2+e3>**}

[[**build**]] =   {<c1,e1>,   <c2,e2>,   <c3,e3>,   <c1+c2,e1+e2>   ,...,

     <c1+c2+c3,e1+e2+e3>}

(24)   X   →   A + B + C

       Y   →   c1 + c2 + c3

       E   →   e1 + e2 + e3

Table 2 illustrates a possible collective situation, in which the three girls build each of the three canoes together. Again, *Õwã nakam'at gooj* comes out true. And the reasons are the same ones that make it hold true of situation 1: there is plural event that is the sum of all three building-canoe events, and has the sum of the three girls as its agent (see (23) and (24)).

Table 2: situation 2 - collective

Agent	Theme	Event
Ana+Bia+Cris	Canoe1	e1
Ana+Bia+Cris	Canoe2	e2
Ana+Bia+Cris	Canoe3	e3

Table 3 illustrates a possible distributive situation in which the three girls – Ana, Bia and Cris - build each one canoe. Again, *Õwã nakam'at gooj* comes out true in this situation. The reasons are the same ones that make the sentence true in the two previous situations: there is a plural event that is the sum of all three buiding-canoe events, and has the sum of the three girls as its agent (see (23) and (24)).

Table 3: situation 3 - distributive

Agent	Theme	Event
Ana	Canoe1	e1
Bia	Canoe2	e2
Cris	Canoe3	e3

As mentioned in section 3, a relevant aspect of Karitiana grammar is that verbs may be marked for number by affix reduplication. This phenomenon has been called pluractionality in the literature (see Cusic 1981, Newman 1990, and Lasersohn 1995). Pluractionality refers to event plurality. Sentence (25) is the pluractional version of sentence (21) repeated below as (25).

Müller & Sanchez-Mendes (2008) defend the hypothesis that pluractional affixes act as plural operators on the cumulative denotations of the verbs in the language. According to the authors, what reduplicated affixes do in Karitiana is subtract singular events from the cumulative denotations of verbs. The effect of the pluractional operation over the denotation of a verb can be grasped by comparing the paraphrase of sentence (26) to the paraphrase of sentence (26).

(25) Õwã nakam'at gooj
　　 õwã Ø-naka-m-'a-t gooj
　　 child 3-DECL-CAUS-build-NFT canoe
　　 'Children built canoes'

Paraphrase: *There is a <u>possibly</u> plural event in which a possibly plural number of children built a possibly plural number of canoes*.

(26) Õwã nakam'ab'adn gooj
　　 õwã Ø-naka-m-'a-m-'a-t gooj
　　 child 3-DECL-CAUS-build-CAUS-RDPL-NFT canoe
　　 'Children built canoes'

Paraphrase: *There is a <u>necessarily</u> plural event in which a possibly plural number of children built a possibly plural number of canoes*.

The interpretation attributed to sentence (26) is exactly the one attributed to sentence (25), except for the fact that its denotation lacks atomic events, as expressed by its

paraphrase. The sentence holds true only of plural events. Atomic events such as *one child building one canoe,* or *a group of children collectively building one canoe,* do not belong to its denotation. Sentences (20a,b), repeated below as (27a,b) illustrate that fact. Sentence (27a) is fit for both singular- and plural-event contexts, whereas sentence (27b) is only fit for contexts in which a plural event has occurred.

(27) a. <u>Contexts</u>: A boy broke two eggs at once (one event only).

A boy broke two eggs, one after the other (more than one event).

Õwã	nakakot		sypomp	opokakosypi.
õwã	∅-naka-kot-∅		sypom-t	opok-ako-sypi
child	3-DECL-break-NFT	two-OBL		egg

'Children broke two eggs'/ 'Child broke eggs twice'

b. <u>Contexts</u>: *A boy broke two eggs at the same time (one event only).

A boy broke two eggs, one after the other (more than one event).

Õwã	nakakokonat		sypomp	opokakosypi.
õwã	∅-naka-kot-kot-a-t		sypom-t	opok-ako-sypi
boy	3-DECL-break-RDPL-TV-NFT	two-OBL		egg

'Children broke two eggs (two or more events)'/ 'Children broke eggs twice'

It is important to note that, according to this analysis of pluractional affixes in Karitiana, reduplication has scope over lexical denotation of verbs, that is, pluractional affixes are not plural or distributive operators over the whole Verb Phrase (VP). They only affect the verb itself. The formulas in (28) and (29) lay out the definitions of the pluractional operator for both intransitive (28) and transitive verbs (29).

(28) PL = λP <s,t>λE [P(E) & non-atomic (E)]

(29) PL = λP <e<s,t>>λX λE [P(X)(E) & non-atomic (E)]

<u>Where</u>: X: variable over singular and plural entities,

E: variable over singular and plural events,

P: variable over predicates,

e: semantic type of entities,

s: semantic type of events.

t: semantic type of sentences

Sentence (26), which is the pluractional version of sentence (25), therefore, is predicted to also hold true of the three situations introduced above, since even if one strips out the atomic events off the predicate denotation, there is still a plural event of which the pluractional sentence holds true. This prediction is actually borne out in the language (cf. Müller & Sanchez-Mendes 2008).

As mentioned in the introduction, Karitiana has distributive numerals, as in sentence (1), repeated below as (30). Sentence (30) is only true of distributive readings, such as the one in our situation 1, in which each girl built one canoe; or, such as our situation 2, in an iterative reading, in which on each occasion, the three girls built one canoe. Note that situation 2 is a collective situation as far as the agent of each event is concerned because the girls always act a group, but it is a distributive situation in that there is one canoe-building event per occasion (day, week, …).

(30) Myhint   myhint   õwã   nakam'at   gooj

      myhim-t   myhim-t   õwã   Ø-naka-m-'a-t   gooj

      one-OBL   one-OBL   child 3-DECL-CAUS-build-NFT canoe

      'Children built canoes distributively (in ones)'

We have shown that both *Õwã nakam'at gooj* and *Myhint myhint õwã nakam'at gooj* have distributive interpretations. This means that both lexical cumulativity and *myhint myhint* generate distributive readings. The question then arises of whether these interpretations have the same semantics. We will tackle this question in the next two sections.

V. Distributivity in Karitiana

In this section, we show that the distributive interpretations generated by lexical cumulativity differ from the distributive and collective interpretations generated by cumulating or pluralizing the whole predicate.

In the previous section, we have gone through the interpretations generated by lexical cumulativity. Sentence (21), repeated below as (31), was shown to have cumulative, collective and distributive interpretations, all of them resulting from lexical cumulativity. Consequently, the fact that sentence (31) holds true of distributive situations such as (32a-c), among others, is a result of the lexical cumulativity and of the denotations of its verb and its nouns. The sentence holds true of any number of building-canoe events, in which any number of children and any number of canoes are involved.

(31) Õwã Ø-naka-m-'a-t   gooj
      child 3-DECL-CAUS-build-NFT   canoe
      'Children built canoes'

(32) a. Each boy built one canoe.
      b. Each boy built n canoes.
      c. On each occasion (day, month, celebration,…) boys built canoes.

The same happens to sentence (33) bellow. In this sentence, the cardinality of the subject is not undefined like that of the subject in (31). This fact, however, does not interfere with the interpretation of the sentence, which holds true of cumulative, collective and distributive situations such as the ones pointed out for sentence (31), except for the fact that the cardinality of the subject is now determined.

(33) Lu Leti   Ø-naka-m-'a-t   gooj
      Lu Leti   3-DECL-CAUS-build-NFT   canoe
      'Lu and Leti built canoes'

However, when the cardinality of the object NP is fixed, distributivity disappears. Sentence (34) below has only cumulative and collective readings. For example, the sentence holds true of a situation in which one of the two girls built a canoe

individually, and the other two girls built the other canoe together - a cumulative reading. It also holds true of a collective situation, in which the two girls built the two canoes together. But, crucially, sentence (34) could not be used to describe distributive situations that involve four canoes or more. For example, the sentence does hold true of a situation in which each girl built two canoes or of a situation in which on every occasion, the girls built two canoes. What happened was that when we kept the cardinality of the entities denoted by the object constant, the number of events denoted by the predicate also became constant.

In the case of sentence (34), the predicate *nakam'at sypomp gooj* 'built two canoes' denotes a relation, in which the first member is filled out by events and the second member is filled out by canoes, such as laid out in (135). More precisely, the predicate *nakam'at sypomp gooj* denotes the set of pairs in which the first member is an event of cardinality two and the second member is a plurality of cardinality two.

(34) Lu   Leti   nakam'at   sypomp   gooj

      Lu   Leti   Ø-naka-m-'a-t   sypom-t   gooj

      Lu   Leti   3-DECL-CAUS-build-NFT   two-OBL   canoe

      'Lu and Leti built canoes in two'

      'Lu and Leti built canoes twice'

(35) [[**build**]] =   {$\langle e_1,c_1 \rangle$, …, $\langle e_1+e_2 \rangle$,… $\langle e_1+e_2+e_3,c_1+c_2+c_3 \rangle$, ...}

      [[**two canoes**]] =   {c_1+c_2, c_1+c_3, c_2+c_4,...}

      [[**build two canoes**]] =   {$\langle e_1+e_2,c_1+c_2 \rangle$, $\langle e_2+e_3,c_2+c_3 \rangle$, …,

                                      $\langle e_n+e_{n+1}, c_n+c_{n+1} \rangle$,… }

In any way one thinks of a distributive interpretation for (34), the result is that the number of events is higher than two. But, as we have just shown, there is no such a plurality in the denotation of *nankam'at sypomp gooj*. From these facts, we conclude that lexical cumulativity alone is not able to pluralize the VP in Karitiana.

Distributive numerals, on the other hand, only allow for distributive interpretations. For example, sentence (36) with the distributive numeral *sypomp sypomp* 'two two', holds true of distributive situations, such as situations in which each of the children built two

canoes or   in which, in each occasion, children built two canoes. Cumulative and collective interpretations as the ones illustrated for sentence (31) are out. This means that *nakam'at gooj* has been pluralized, that is, its denotation contains plural events of building two canoes.

(36) Sypomp   sypomp   õwã   nakam'at   gooj

sypomp-t   sypomp-t   õwã   Ø-naka-m-'a-t   gooj

two-OBL   two-OBL   child   3-DECL-CAUS-build-NFT   canoe

'Children built canoes distributively (in twos)'

Sentence (36), which is exactly the same as sentence (34), except for the presence of the distributive numeral, patterns exactly like sentence (36) int that it has only distributive readings, meaning either that the two girls built two canoes each, or that, on each (contextually given) occasion, the two girls built two canoes.

(37)

Sypomp sypomp   Lu Leti   nakam'at   sypomp   gooj

sypom-t sypom-t   Lu Leti   Ø-naka-m-'a-t   sypom-t   gooj

two-OBL two-OBL   Lu Leti   3-DECL-CAUS-build-NFT   two-OBL   canoe

'Lu and Leti built two canoes distributively (in twos)'

We conclude then that lexical cumulativity differs from VP plurality/distributivity (Kratzer 2003, 2005), and that distributive numerals are plural operators over VP denotations. Having settled this issue, we turn to an analysis of distributive numerals as plural operators over the VP.

VI. MYHINT-MYHINT – The Analysis

In this section, we focus on the semantics of distributive numerals in Karitiana. We claim that distributive numerals are adverbial operators - they pluralize the event argument of the predicate and impose a homogeneity restriction on it.

The analysis for *myhint myhint* 'one one' is laid out in (38) and given a logical representation in (39). The logical representation states that an event that makes a

sentence with *myhint myhint* true is a plural event, whose subevents are atomic. In the case of other distributive numerals like, for example, *sypomp sypomp* ('two two') or *myjim myjym* ('five five'), the cardinality of the subevents is defined by the reduplicated numeral.

(38) *Myhint-myhint P* is true in eventuality E iff E has smaller eventualities e_1, e_2, …, e_n, e_{n+1}, … as parts, in which P is true, and e_n is atomic.

(39) [[**myhint myhint**]] = $\lambda P_{<s,t>} \lambda E [P(E) \& \exists e_1 \ldots e_n [e_1 \ldots e_n < E \&$ atomic $(e_n) \& P(e_n)]$[8]

Sentence (40), which is the distributive numeral version of sentence (31), is taken to have a meaning that can be paraphrased as 'There was a canoe building event by children and this event can be divided into subevents which are atomic and individualized on the basis of participants or occasions. Its logical representation is laid out in (41).

(40)

Myhint	myhint	nakam'at	gooj	õwã
myhim-t	myhim-t	Ø-naka-m-'a-t	gooj	õwã
one-OBL	one-OBL	3-DECL-CAUS-build-NFT	canoe	child

'Children built canoes distributively (in ones)'

(41) $\exists E \exists X \exists Y$ [**build** (Y) (E) & **agent**(X)(E) & **child**(X) & **canoe**(Y) & $\exists e_1 \ldots e_n [e_1 \ldots e_n < E \&$ **atomic** $(e_n) \&$ **build** $(Y)(e_n) \&$ **canoe** (Y)]]

What this analysis claims is that *myhint-myhint* pluralizes the VP, and, in that sense, it ends up distributing events of building-one-canoe by relating these events to the participants or occasions, which are precisely the ones used to individualize them.

---

[8] Where: E, e_n: variables over singular and plural events; X, Y: variables over singular and plural individuals; P: variable over properties of events, s and t: semantic types for events and sentences respectively.

In this section, we have claimed that distributive numerals in Karitiana are plural operators over VP denotations. In the next section, we provide evidence that lends support to the analysis of distributive numerals that we have just presented.

VII. Evidence for the Analysis

The main purpose of this section is to provide evidence for the analysis of distributive numerals as distributive adverbials.

In order to provide syntactic evidence that distributive numerals are adverbials, we will strongly rely on Storto's 1999 proposal for the clausal structure of Karitiana. As mentioned in the introduction, Karitiana is a verb final language that exhibits obligatory raising of the verb to the head of Complementizer Phrase (CP) in matrix clauses, and thus exhibits a verb second matrix clause pattern.

The observation that there is a complementary distribution between matrix and embedded sentences with regard to the presence versus absence of the inflectional markers of tense and agreement motivates for the second position verb movement analysis for main clauses, in as much as the author gives solid evidence for the fact that it is in the Complementizer Phrase projection that nominative case is checked.

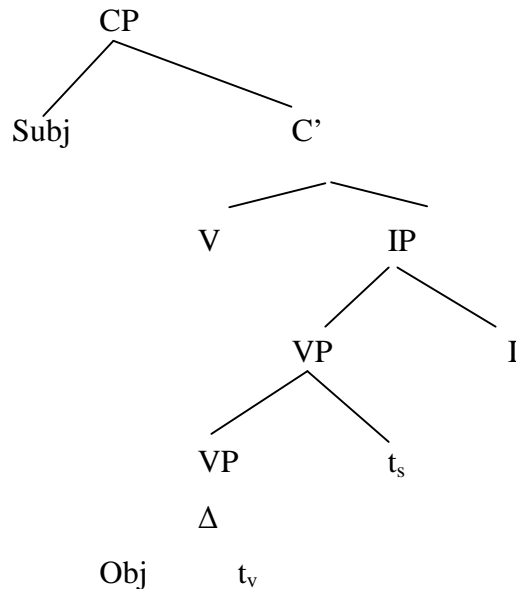We have also mentioned that, in matrix clauses, verbs are inflected for tense and agreement whereas, in embedded clauses, verbal inflection induces ungrammaticality. In order to accommodate this generalization, Storto 1999 proposes the following structures for embedded clauses (42) and matrix clauses (43), respectively:

(42)   [$_{AspP}$ [$_{VP}$ [$_{VP}$ Obj t$_v$] Subj] [$_{Asp}$ V Asp]]
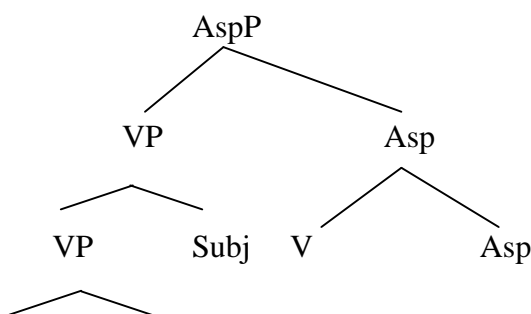
Obj t_v

(43)   [$_{CP}$ Subj [$_{C'}$ V [$_{IP}$ [$_{VP}$ [$_{VP}$ Obj t_v] t_s] I]]]

```
                        CP
                       /   \
                   Subj      C'
                             /  \
                            V    IP
                                /  \
                              VP     I
                             /  \
                           VP    t_s
                            Δ
                      Obj      t_v
```

In Storto's analysis of embedded clauses in structure (42), the verb moves from its base position to the head final position of the only embedded clause functional projection, an Aspectual Phrase (AspP).

The author`s analysis of matrix transitive clauses is presented in structure (43), in which, as already pointed out, the verb raises as far as C^o. When the verb is in C^o, the subject usually raises to the Specifier of CP position (Spec CP) and the object is licensed *in situ*.

The position of adverbs in the sentence is used by the Storto 1999 to give support to the clause structure analyses proposed above. In Karitiana, adverbs left adjoin to maximal projections, except for the ones above CP, which may also right adjoin to CP. The author points out that, as far as her data shows, there is no difference between the distribution of manner adverbs such as *mynda* 'slowly', usually assumed in the literature to be adjoined to the VP, and the distribution of time adverbials such as *koot* 'at noon',

assumed to be adjoined to IP. The paradigm in (44) shows the distribution of the adverb *mynda* in subordinate clauses:

(44) a.   [mynda   ysypy'et   him   okej]   Adv S O V

                mynda   y-sypy'et   him   okej   Storto 1999

                slowly   1s-uncle   meat   cut

                'My uncle cut the meat slowly'

      b.   *[y-sypy-'et   mynda him   okej]   * S Adv O V

                   1s-uncle   slowly meat   cut   Storto 1999

      c.   *[y-sypy'et   him   mynda okej]   * S O Adv V

                   1s-uncle   meat   slowly   cut   Storto 1999

      d.   *[y-sypy'et   him   okej   mynda]   *S O V Adv

                   1s-uncle   meat   cut   slowly   Storto 1999

Therefore, there is only one position available for adverbs in embedded clauses. The assumption that adverbs left adjoin to maximal projections and the structure proposed in (42) account for this distribution. The grammaticality of (44a) as opposed to the ungrammaticality of (44b,c,d) is also accounted for, in as much as left adjunction either to VP or to AspP in (42) will result in the adverb occurring in the first position of the embedded clause.

The paradigm in (45) shows the distribution of adverbs in matrix clauses:

(45)

a.   Mynda   taso   nampotporaj   esse   Adv S V O

        mynda   taso   Ø-na-m-potpora-j   esse   Storto 1999

        slowly   man   3-DECL-CAUS-boil-FUT water

       'Men boiled water slowly'

b.   *Taso mynda   Ø-na-m-potpora-j   esse   *S Adv V O

        man   slowly   3-DECL-CAUS-boil-FUT   water   Storto 1999

c.	Taso	Ø-na-m-potpora-j	mynda	esse	S V Adv O
	man	3-DECL-CAUS-boil-FUT	slowly	water	Storto 1999

d.	Taso	Ø-na-m-potpora-j	esse	mynda	S V O Adv
	man	3-DECL-CAUS-boil-FUT	water	slowly	Storto 1999

According to Storto 1999, the adverb *mynda* may be left adjoined to CP as in (45a), right adjoined to CP as in (45d) or left adjoined to VP as in (45c). The ungrammaticality of sentence (45b) is evidence for the raising analysis of the verb to C^o followed by the raising of the subject to Spec CP. No constituent can come between the subject and the verb in a Spec-head configuration.

For our purposes in this paper, adverb position will be used to build our syntactic arguments in favor of the analysis of distributive numerals as adverbial distributive operators. We will present an analysis for *myhint myhint* and assume that it can be carried out for all other distributive numerals.

Our first argument has to do with the fact that *myhint myhint* has the same distribution in the sentence as that of other adverbials. In paradigm (46), the ungrammaticality of (46b) contrasts with the grammaticality of (46a, c, d). In matrix clauses, *myhint myhint* may be left adjoined to CP as in (46a), right adjoined to CP as in (46d) or left adjoined to VP as in (46c). As other adverbials in the language, *myhint myhint* cannot intervene between the subject and the verb in CP (see 46b).

(46)

a. Myhint   myhint   nakam'at   gooj   õwã

   myhim-t   myhim-t   Ø-naka-m-'a-t   gooj   õwã

   one-OBL   one-OBL   3-DECL-CAUS-build-NFT   canoe   child

   'Children built canoes distributively (in ones)'

b. *Õwã   myhin-t   myhin-t   Ø-nakam'at   gooj

   child   one-OBL   one-OBL   3-DECL-CAUS-build-NFT   canoe

c. Õwã   Ø-nakam'at   myhin-t   myhin-t   gooj

child   3-DECL-CAUS-build-NFT   one-OBL   one-OBL   canoe

d. Õwã   Ø-nakam'at   gooj myhin-t   myhin-t

child   3-DECL-CAUS-build-NFT   canoe one-OBL   one-OBL

In embedded clauses, the paradigm in (47a-d) shows that the only possibility is for *myhint myhint* to be adjoined to VP (or AspP), which is as expected for structure (42) if *myhint myhint* is an adverbial.

(47)   a.

[Myhint myhint   jonso õwã   mangataty]   ytapyting   yn

[myhim-t myhim-t   jonso õwã   mangat<a>-ty]   y-ta-pyting-∅   yn

one-OBL one-OBL   woman child lift-OBL   1s-DECL-want-NFT   I

'I want women to lift children distributively (in ones)'

b.

*[jonso   myhint myhint   õwã   mangataty]   ytapyting   yn

   woman   one-OBL one-OBL   child   lift-OBL   1s-DECL- want-NFT   I

c.

*[jonso   õwã   myhint myhint   mangataty]   ytapyting   yn

   woman   child   one-OBL one-OBL   lift-OBL   1s-DECL- want-NFT   I

d.

*[jonso   õwã   mangataty   myhint myhint]   ytapyting   yn

   woman   child   lift-OBL   one-OBL one-OBL   1s-DECL- want-NFT   I

A second argument that supports our claim is that *myhint myhint* occupies the same position as other adverbial quantifiers such as *kandat*, as shown by the sentences in (48). The fact that *myhint myhint* patterns in distribution with other adverbial quantifiers such as *kandat*, gives strong support for its analysis as an adverbial operator.

(48)   a.   Kandat   jonso   nakaot   esse   Adv S V O

	kandat	jonso	Ø-naka-ot-Ø	esse	
	kandat	woman	3-DECL-get-NFT	water	

'Women brought water many times'

b.	*jonso	kandat	Ø-naka-ot-Ø	esse	S Adv V O
	woman	kandat	3-DECL-get-NFT	water	

c.	jonso	Ø-naka-ot-Ø	kandat	esse	S V Adv O
	kandat	3-DECL-get-NFUT	kandat	water	

d.	jonso	Ø-naka-ot-Ø	esse	kandat	S V O Adv
	woman	3-DECL-get-NFT	water	kandat	

A third argument can be built if we take into consideration Storto's claim that there is subject raising to SpecCP when the subject occupies the first position in Karitiana's sentences. According to this analysis, in all the sentences of the paradigm in (46), subject raising has taken place. Note that *myhint myhint* may (46a) or may not (46c,d) be adjacent to the subject NP,and that it may (46b,c) or may not (46a) be adjacent to the object NP. Based on this data, we conclude that the subject NP raises by itself and that *myhint myhint* does not form a constituent either with the subject NP or with the object NP.

Our fourth argument comes from the structure of noun phrases in Karitiana, which have no non-empty functional projections.[9] As mentioned in section III, there are no morpho-syntactic markers for number, classifiers or (in)definiteness within the nominal system in Karitiana. In sentence (49) below, the phrase *myhint pikom* 'one monkey' is semantically singular, whilst in sentence (50) the phrase *sypomp pikom* 'two monkeys' is semantically plural. However, the NPs of both sentences remain uninflected for number in both contexts. Note that numerals are adjuncts in the language. Sentence (51) conveys the meaning that the speaker ate an undefined number of monkeys (one or more) which is expressed by the uninflected bare noun *pikom*. Sentences (49) and (50)

---

[9] We are abstracting away from the DP/NP distinction, since a discussion of whether nominal phrases in Karitiana are DPs our NPs is outside the scope of this paper.

also demonstrate that Karitiana is not a language which demands the insertion of numeral classifiers in cardinal DPs.

(49) Yn   naka'yt   myhint   pikom

yn   Ø-naka-'y-t   myhin-t   pikom

1s   3-DECL-eat-NFT   one-OBL   monkey

'I ate one monkey'

(50) Yn   naka'yt   sypomp   pikom

yn   Ø-naka-'y-t   sypom-t   pikom

1s   3-DECL-eat-NFT   two- OBL   monkey

'I ate two monkeys'

(51) Yn   naka'yt   pikom

yn   Ø-naka-'y-t   pikom

1s   3-DECL-eat-NFT   monkey

'I ate (a/some) monkeys'

In Karitiana, there are no markers for definiteness/indefiniteness and/or definite/indefinite determiners. Bare nouns are understood as definite or indefinite based on the context in which they occur. In sentence (52) below, for example, both *taso* 'man' and *boroja* 'snake' can be understood as definite or indefinite, singular or plural, depending on the context in which the sentences are uttered. Sentence (52) also shows that the denotation of common nouns in Karitiana does not make a difference between singular and plural number, since the sentence conveys the meaning that one or more snakes were eaten by one or more men.

(52) Taso naka'yt   boroja

taso Ø-naka-'y-t   boroja

man   3-DECL-eat-NFT   snake

'A/the/some man/men ate a/the/some snake(s)'

There are no quantifiers that occur within the NP in Karitiana. All quantifiers are adverbial (Müller *et al.* 2006). Quantifiers that do a similar job as that of 'much',

'many', or 'several' are sentential adverbials. Paradigm (48) above shows that the morphosyntactic distribution of *kandat* ('much'/ 'many'/ 'many times') is that of an adverbial, not that of a determiner.

Nevertheless, the universal quantification marker and demonstratives could be potential counter-examples to our claim. Observing the paradigm in (53), one could hypothesize that *akatyym*, the universal quantification marker, is a determiner quantifier that forms a constituent with the head noun, in as much as it appears right adjacent to the noun over which it operates (the subject in (53a) and the object in (53b)), a position that is occupied by nominal determiners in a head final languages. It is also ungrammatical in head-first position, which would not be expected if it were a D-quantifiers.

(53)

a. Taso   akatyym   nasoko'it   eremby   Coutinho-Silva 2009
    taso   aka-tyym   Ø-na-soko'i-t   eremby
    man   be-SUB   3-DECL-tie-NFT   hammock
      'All men tied hammocks'

b. Taso   nasoko'it   eremby   akatyym   Coutinho-Silva 2009
    taso   Ø-na-soko'i-t   eremby   aka-tyym
    man   3-DECL-tie-NFT   hammock   be-SUB
    'Men tied all hammocks'

c. *Akatyym   taso   nasoko'it   eremby   Coutinho-Silva 2009
     aka-tyym   taso   Ø-na-soko'i-t eremby
     be-SUB   man   3-DECL-tie-NFThammock
     'All men tied hammocks'

d. *Taso nasoko'it   akatyym   eremby   Coutinho-Silva 2009
     taso Ø-na-soko'i-t   aka-tyym   eremby
     man   3-DECL-tie-NFT   be-SUB   hammock
     'Men tied all hammocks'

Remember that, in matrix clauses, adverbials and adverbial quantifiers cannot break the adjancency between the subject and the verb in matrix clauses. This obligatory adjancency is explained by the obligatory movement of the verb to the C^o position, followed by the movement of the subject to the CP specifier position of the matrix clause. The paradigm in (53) shows a contrast between the distribution of *akatyym* in matrix clauses when compared to the distribution of distributive quantifier *myhint myhint* (see (29), that is explained by the clausal structure of the former in contrast with the adverbial nature of the latter.

Nevertheless, as hinted by the glosses, *akatyym* has internal structure. Coutinho-Silva 2009 claims that the nominal constituent which contains *akatyym* has the structure of a relative clause (see also Müller et al 2006 for a similar claim). Relative clauses in Karitiana are verb final, just like other subordinate clauses, as illustrated in (54).

(54) Ypyso'ooton   yn   eremby   João   tisokõit   Storto 1999

     y-py-so'oot-on   yn   eremby   João   ti-sokõi-t

     1s-ASSERT-see-NFUT I   hammock   João   OFC-tie.up-OBL

     'I saw hammocks João tied up'

Demonstratives, which could also be thought as possible counter-examples to the claim that Karitiana has no D-quantifiers, are also analysed by Müller et al 2006 and Coutinho-Silva 2009 as relative clauses. Karitiana has a set of lexical items denoting body positions that enter in an embedded clause with the copula *aka* and the noun it locates. Sentence (55) is an example:

(55) Dibm   nakatari   ony   taso   aka

     dibm   Ø-naka-tar-i ony   taso   aka

     tomorrow   DECL-go-FUT   there man   be

     'That man will go tomorrow'

(Literally: Man [which] be over there will go tomorrow)

Our last and most important argument is that the interpretation of sentences with *myhint myhint* does not depend on the syntactic position of the operator. In (46), no matter what

position the distributive numeral occupies (among the ones that are possible for it), the meaning is always the same: *children built canoes distributively (in ones).*

We conclude, therefore, that distributive numerals are adverbial operators.

VIII. Conclusions

We have shown that Karitiana expresses VP distributivity by means of distributive numerals. These operators have been claimed to be adverbial plural operators over the predicate.

The semantics of Karitiana nouns and verbs provides support for the Cummulativity Universal as proposed by Krifka 1992, Landmann 1996 and Kratzer 2003, 2005. It also provides evidence for the existence of (at least) two sources for plurality and distributivity: lexical cumulativity and VP cumulativity, as predicted by Kratzer (2003, 2005).

References

COUTINHO-SILVA, Thiago 2005. *O Sintagma Nominal em Karitiana*. Trabalho presented at the XIII Simpósio Internacional de Iniciação Cientifica da USP, São Paulo.

_____ 2009. Aspectos dos Sintagmas Nominais em Karitiana: A Quantificação Universal. M.A. thesis, University of São Paulo.

CUSIC, David 1981. *Verbal Plurality and Aspect.* Ph. D. Dissertation, University of Stanford.

DAVIDSON, Donald 1967. The Logical Form for Action Sentences. In: ASCHER (Ed.) *The Logic of Decision and Action*. Pittsburgh: University of Pittsburgh Press, pg. 81-95.

GIL, David 1982. *Distributive Numerals*. PhD Dissertation, University of California, Los Angeles.

_____1995. Distributive Numerals. In: Haspelmath, Martin & Dryer, Matthew S. & Gil, David & Comrie, Bernard (eds.) *The World Atlas of Language Structures Online*.Munich: Max Planck Digital Library, chapter 54. Available online at http://wals.info/feature/54. Accessed on 2008-11-03.

EVERETT, Caleb 2005. *Patterns in Karitiana: Articulation, perception, and grammar.* PhD Dissertation, Rice University.

EVERETT, Daniel 1985. A note on ergativity S' e S'' in Karitiana. In: DERBYSHIRE, D. (Ed.). *Workpapers of the Summer Institute of Linguistics*. Grand Forks: University of North Dakota, v. 29, pg. 69-81.

_____1993a. *Valency vs. Transitivity: evidence from selish **m**, romance **se**, and Karitiana case-spreading*. Colloquium, Department of Linguistics, University of Oregon.

_____1993b. *Case spreading and phrase structure in Karitiana*. Western conference on linguistics (WECOL). Seattle : University of Washington.

_____ 1994. *The syntax and phonology of case-spreading in Karitiana*. In: Proceedings of WECOL (Western Conference on Linguistics), 1994.

KRATZER, Angelika 2003. *The Event Argument and the Semantics of Verbs*. http://semanticsarchive.net. 2. Accessed on May 5, 2008.

_____ 2005. On the Plurality of Verbs. In: J. Dölling & T. Heyde-Zybatow (eds.), *Event Structures in Linguistic Form and Interpretation*. Berlin: Mouton de Gruyter, Berlin.

KRIFKA, Manfred 1992. Thematic Relations as Links between Nominal Reference and Temporal Constitution. In: SAG, I.; SAZBOLSCI, A. (Ed.), *Lexical Matter*. Chicago: CSLI, pg. 29-53.

LANDIN, David 1983. *Dicionário e Léxico Karitiana/Português*. Brasília: SIL.

_____ 1984. An Outline of the Syntactic Structure of Karitiana Sentences. *Estudos Sobre Línguas Tupi do Brasil*. Série Linguística 11. SIL, 1984.

_____ 1988. As Orações Karitiana. *Série Linguística 9 (2).* Brasília: SIL, 1988.

LANDIN, Rachel 1982. Word Order Variation in Karitiana. *Arquivo Linguístico 149*. Brasília: SIL.

_____1987. Conjunções Karitiana de Nível Superior. *Série Linguística 9(1).* Brasília: SIL.

_____1989. *Kinship and Naming Among the Karitiana of Northwestern Brazil*. Masters Thesis. U. Texas, Arlington, 1989.

LANDIN, David & Rachel LANDIN 1973. A Preliminary Description of the Karitiana Phonological Structure. *Arquivo Linguístico 163*. Brasilia: SIL.

LANDMAN, Fred 1996. Plurality. In: LAPPIN, S. *The Handbook of Contemporary Semantic Theory*. Oxford: Blackwell, pg. 425-457.

LASERSOHN, Peter 1995. *Plurality, Conjunction, and Events*. Dordrecht, Boston: Kluwer Academic Publishers.

MATHEWSON, Lisa 2004. On the Methodology of Semantic Fieldwork. *International Journal of American Linguistics 70*, pg. 369-415.

MÜLLER, Ana & Luciana SANCHEZ-MENDES 2008. Pluractionality in Karitiana. Proceedings of SuB 12, Oslo: Department of Literature, Area Studies and European Languages, University of Oslo, pp. 442-454.

MÜLLER, Ana, Luciana STORTO & Thiago COUTINHO-SILVA 2006. Number and the count-mass distinction in Karitiana. *UBCWPL 19: Proceedings of the Eleventh Workshop on Structure and Constituency in Languages of the Americas*, pg. 122-135.

NEWMAN, Paul 1990. *Nominal and Verbal Purality in Chadic*. Dordrech: Foris.

PARSONS, Terence 1990. *Events in the Semantics of English: A Study in Subatomic Semantics.* Cambridge: MIT Press.

SANCHEZ-MENDES, Luciana 2006. A Expressão da Quantificação em Karitiana. *Caderno de Pesquisa na Graduação em Letras – Revista da Associação Nacional de Pesquisa na Graduação em Letras. Ano III,* number 3, pg. 103-110.

SCHEIN, Barry 1993. *Plural and Events*. Cambridge: MIT Press.

STORTO, Luciana 1999. *Aspects of Karitiana Grammar*. MIT Ph.D. dissertation, 1999.

_____1994. Basic Word Order in Karitiana, *Report 8: Survey of California and Other Indian Languagesi*, 138-144. Department of Linguistics. University of California at Berkeley.

_____ 1995. Relatório de Pesquisa Dirigido à FUNAI - Descrição e Análise da Língua Karitiana.

_____ 1997a. Verb Raising and Word order variation in Karitiana. *Boletim da Associação Brasileira de Lingüística (ABRALIN) no.20 - Homenagem a Aryon Dall'igna Rodrigues*.

_____1997b. A Report on Language Endangerment in Brazil. *MIT Working Papers in Linguistics 28*. Pensalfini, R., J. Bobaljik, and L. Storto (eds.). MITWPL.

_____1998a. Karitiana: A verb Second Language from Amazonia. *Proceedings of the Sixth Conference of Students of Linguistics of Europe (CONSOLE)*.

_____ 1998b. Karitiana: A Verb Second Language From Amazonia. In: Sixth Conference of Students of Linguistics of Europe, 1998. *Proceedings of the Sixth Conference of Students of Linguistics of Europe. Lisbon, Portugal*.

_____1999. *Aspects of Karitiana Grammar*. MIT Ph.D. dissertation.

_____2000. Concordância Irregular em Construções de Foco do Objeto em Karitiana. *ABRALIN*, Florianópolis. Associação Brasileira de Lingüística.

_____2001. Duas Classes de Verbos Intransitivos em Karitiana (Família Arikém, Tronco Tupi). QUEIXALOS, F. (Org.). *Des noms et des verbes en tupi-guarani*. Muenchen: Lincom-Europa, pg. 163-180.

_____2002a. Categorias Funcionais em Karitiana. In: CABRAL; RODRIGUES (Org.). *Atas do Grupo de Trabalho em Línguas Indígenas*. Belém: UFPA.

_____2002b. Dicionário Karitiana-Português-Inglês: um produto do processo de educação na língua Karitiana. In: CABRAL; RODRIGUES (Org.). *Atas do Grupo de Trabalho em Línguas Indígenas*. Belem: UFPA.

_____2003. Interactions between verb movement and agreement in Karitiana. *Revista Letras*, n. 60, pg. 411-433.

_____2004. Passives, Antipassives and Object Focus Constructions in Karitiana. *Artigo apresentado na conferência internacional da EVELIN*, Campinas, UNICAMP, 2004.

STORTO, L.; VAN DER VELDEN, F.F. Karitiana. *Povos Indígenas do Brasil*. Disponível em http://www.socioambiental.org/pib/epi/karitiana/karitiana.shtm. 2005. Accessed on May 5, 2008.