

COUNT/MASS DISTINCTION IN KUIKURO: ON INDIVIDUATION AND COUNTING

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ABSTRACT

This paper analyses the processes of individuation and counting in Kuikuro (Southern Carib, Brazil). Kuikuro is a number-neutral language characterized by the absence of numeral classifiers. The central aspect we discuss in this paper is the fact that individuation is a context-dependent operation (cf. Rothstein (2010), Lima (2012)).

KEY WORDS: Kuikuro, count/mass distinction, individuation, numerals, counting.

INTRODUCTION

Linguists and philosophers have extensively discussed how languages encode the distinction between so-called ‘count nouns’ (e.g. dog) and so-called ‘mass nouns’ (e.g. blood) (see Quine 1960, Burge 1972, 1975, Pelletier 1975, 2009, 2012, Bunt 1979, 1985, Link 1983, Gillon 1992, Krifka 1995, Chierchia 1998a, 1998b, 2010, Nicolas 2002, Borer 2005, Schwarzschild 2006, Rothstein 2010, Bale and Barner 2009, among many others).

Across many languages, these classes of nouns have distinct morphological and syntactic properties. The exact properties that distinguish ‘mass’ from ‘count’ nouns can vary from language to language. Chierchia (1998a, 1998b, 2010) has established three different categories of languages: number-marking languages, classifier languages and number-neutral languages. In the so-called number-marking languages, only count nouns can be pluralized:

- 1a This dog/girl is happy
1b These dogs/girls are happy
- 2a That blood is RH Positive
2b ?? Those bloods are RH Positive (Chierchia 2010; 109 – examples (19a) and (19b))
- 3a That gold weighs two ounces
3b ?? Those golds weigh two ounces (Chierchia 2010; 109 - examples (19c) and (19d))

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In the examples above, *dog* and *girl*, but not *blood* and *gold* can be pluralized because the former but not the latter have clearly individuated entities in their extensions. In addition, the determiner system is sensitive to the mass/count distinction in English:

- | | | | |
|----|---------------|--------------------|----------------------|
| 4. | the/some boy | 4'. the/some boys | 4''. the/some water |
| 5. | a/every boy | 5'. * a/every boys | 5''. * a/every water |
| 6. | *most/all boy | 6'. most/ all boys | 6''. most/ all water |

(Chierchia 2010 - examples (21a), (21b) and (21c))

The determiners *the* and *some* can combine with any noun, either count (4 and 4') or mass (4''). Determiners such as *a* and *every* are restricted to singular count nouns (5). Finally, determiners such as *most* and *all* are restricted to plural and mass nouns (6' and 6'', respectively).

Not only English but other number-marking languages, such as the Romance languages², use these two morphosyntactic criteria - pluralization of count nouns and distribution of quantifiers – to distinguish these two classes of nouns. Finally, a container or a measure phrase is required for a mass noun to be combined with a numeral ('three quarts of blood' (measure); 'three tubes of blood' (container); * 'three blood(s)'). Without such a container or measure phrase, the sentence is either ungrammatical, or else reinterpreted so that the mass noun shifts its interpretation ('we drank three beers', meaning 'three bottles of beer'; cf. Gleason 1965, Pelletier 1975, Frisson and Frazier 2005, Wiese and Maling 2005, Lima 2012).

The second type of language described in Chierchia's count/mass typology is the classifier languages. Classifier languages are characterized by (i) bare arguments, that is, nouns that are not associated with any functional material, occurring without articles, number inflection, case, etc.; (ii) the absence of pluralization and (iii) the requirement of a classifier. A classifier is understood here as "a word that denotes something like a measure, a container, or shape based words that express something like 'unit'" (Chierchia 2010; 107):

Mandarin Chinese

- | | | | | | | | |
|-----|--------------|-------|--------|----|------------|--------|------|
| 7a. | San | *(ge) | nanhai | 7b | Yi | *(ben) | shu |
| | three | CL | boy | | one | CL | book |
| | 'Three boys' | | | | 'One book' | | |

(Chierchia 2010; 107 – examples 15a and 15b)

Examples 7a and 7b show that nouns in Chinese require a classifier, including nouns that have well-individuated atoms in their extensions, such as *nanhai* 'boy' and *shu* 'book'. Note, however, that the distribution of classifiers is not unrestricted in this language. Cheng and Sybesma (1999) argue in favor of count-classifiers and mass-classifiers (henceforth massifiers) in Chinese. For instance, the classifier *ge* does not combine with mass nouns or, if it does, it forces a count interpretation³:

Mandarin Chinese

- | | | | |
|---|---------------------------|----|-------|
| 8 | ?? San | ge | xue |
| | three | CL | blood |
| | 'Three portions of blood' | | |

(Chierchia 2010; 107 – example 14)

2. There is an extensive literature on the count-mass distinction in Brazilian Portuguese. Consult Paraguassu-Martins and Müller (2007) and references therein.

3. There is a debate about whether some classifiers are associated only to count nouns and others only to mass nouns in Chinese. See Li (2010).

Cheng and Sybesma (1999) show that some modifiers and adjectives can occur with one class of classifiers but not with the other. For instance, a modifier marker *de* can intervene between [massifier+N], but not between [count-classifier+N]:

Mandarin Chinese

9a. San bang (de) rou
 three CL.pound DE meat
 ‘Three pounds of meat’

(Cheng and Sybesma 1999; 515 – example 12a)

9b. Ba tou (*de) niu
 eight CL.head DE cow
 ‘Eight cows’

(Cheng and Sybesma 1999; 516 – example 13a)

Another aspect of the distribution of classifiers in Chinese is the fact that some adjectives modify massifiers but not count-classifiers:

Mandarin Chinese

10a. yi da zhang zhi 10b. *yi da zhi gou
 one big CL.sheet paper one big CL dog
 ‘One large sheet of paper’

(Cheng and Sybesma 1999; 516 – examples 14a and 15a)

This set of examples show that even though pluralization and distribution of determiners are not criteria for the distinction between count and mass nouns in Chinese, other criteria can be used to establish this distinction.

The third type of language described in the literature, the number-neutral languages, share some properties with classifier languages. To start with, these languages, like classifier languages, are characterized by bare arguments:

Dëne Suliné

11a. k’ásba nághilnígh 11b. li dëneyuaze theál
 chicken PERF-1SG-buy O dog boy-DIM PERF-bit/chew O
 ‘I bought a chicken’ ‘The dog bit the little boy’

(Wilhelm 2008; 45 - examples 4a (11a) and 4e (11b))

In these examples, the nouns in argument position (subject or object) are bare. That is, *k’ásba* ‘chicken’ (in 11a) *li* ‘dog’ and *dëneyuaze* ‘boy’ (in 11b) do not bear definiteness, case nor number inflection. The second characteristic that number-neutral languages share with classifier languages is the absence of plural morphology:

Dëne Suliné

12a. Larry lághe ejëre nághélnígh
 Larry one bovine PERF-buy O
 ‘Larry bought one cow’

- 12b. Larry ejëre nádághélnígh
 Larry bovine DIST-PERF-buy O
 ‘Larry bought several cows/ cattle’
 (Wilhelm 2008; 45 - examples 5a and 5b)

In the examples above, *ejëre* has the same morphological form for singular (‘cow’ (12a)) and plural (‘cows’ (12b)), where, crucially, no morphology is added. What distinguishes count and mass nouns in these languages is the fact that count nouns can directly combine with numerals while mass nouns cannot. That is the first property that distinguishes classifier languages from number-neutral languages. Differently from classifier languages, number-neutral languages have no classifier systems (therefore, no numeral classifiers in constructions with mass nouns and numerals). Instead, as in number-marking languages, in number-neutral languages a numeral cannot combine with a mass noun without an intervening container or measure phrases (13c):

Dëne Suliné

- 13a. Solághe dzol
 five ball
 ‘Five balls’
 (Wilhelm 2008; 46 - example (8c))

- 13b. * Solághe ber 13c. Solághe nedádhi bër
 five meat five pound meat
 ‘Five pounds of meat’
 (Wilhelm 2008; 47 - example (9b)) (Wilhelm 2008; 47 - example (10a))

Scholars challenged Chierchia’s typology based on the documentation of languages that on the surface seem to lack a count/mass distinction. Some examples include Algonquian languages such as Innu-aimun. Gillon (2010) argues that in spite of the apparent absence of a count/mass distinction in Innu-aimun, the distribution of the plural morpheme in constructions with quantifiers provides evidence for grammatical differences between count and mass nouns. In Innu-aimun (Gillon 2010; 22), all nouns can occur with any class of quantifier, but only count nouns and some mass nouns can be pluralized in constructions with the quantifier *mítshet* ‘many/much’:

Innu-aimun

- 14a. Mítshet utenâu 14b. mítshet utenâu-a
 lots/many town lots/many town- INAN.PL
 ‘Many towns’ ‘Many towns’
- 15a. pimî 15b. pimî-a 16a. mítshet pimî 16b. * mítshet pimî-a
 oil oil-INAN.PL lots/many oil lots/many oil-INAN.PL
 ‘Oil’ ‘Oil(s)’ ‘Lots of oil’ (intended: lots of bottles of oil)
- (Gillon 2010; 12/21/22; examples: 1c/d; 30b, 31d, 32c, 33c)

In Ojibwe, scholars (Rhodes 1990:153 *apud* Mathieu 2012; 172) suggested that there is no grammatical distinction between count and mass nouns because any noun can be pluralized in this language, even mass nouns, as in Halkomelem Salish (Mithun 1988) and St’at’imcets (Davis and Matthewson 1999; 60-61). Contrary to this view, Mathieu (2012; 186) shows that ‘pluralized mass nouns receive a measure reading’ as illustrated below:

Objibwe

- 17a. mikwam 'ice' mikwam-iig 'pieces of ice'
 17b. Semaa 'tobacco' semaa-g 'wads or pieces of tobacco'
 (Mathieu 2012; 184; example 30)

In Yudja (Tupi, Brazil), a number-neutral language, any noun can be interpreted as count. Two facts from the language support this hypothesis: first, all nouns can be directly combined with numerals, even when coercion (universal packager) is not possible (cf. Lima 2010, 2012, 2013 for details):

Yudja

- Ba'i 'paca' 18a. Txabiũ ba'i wãã
 three paca ran
 'Three pacas ran'
- Ali 'child' 18b. Txabiũ ali wãã
 three child ran
 'Three children ran'
- Pikaha 'chair' 18c. Txabiũ Maria pikaha ïwã
 three Maria chair buy.PL
 'Maria bought three chairs'
- Yukidi 'salt' 18d. Maria txabiũ yukidi apa
 Maria three salt drop/fall
 'Maria dropped three (portions of) salt'
- Apeta 'blood' 18e. Txabiũ uda apeta wi
 three someone blood bring
 'Someone brought three (portions of) blood'
- Y'a 'water' 18f. Maria yauda y'a dju wi
 Maria two water bring
 'Maria brought two (portions of) water'

Second, Yudja has a pair of 'count' quantifiers (*itxibi* 'many' / *kĩnana hinaku* 'few') that are compatible with all nouns:

iidja 'woman' (human)

- 19a. itxibi iidja 19b. kĩnana hinaku iidja
 many iidja few woman
 'Many women' 'Few women'

y'a 'water' (substance)

- 19a. itxibi y'a 19b. kĩnana hinaku y'a
 many water few water
 '(There are) many containers of water' '(There are) few containers of water'

A key observation of this paper is that the Kuikuro language does not obviously fit in the general picture described by Chierchia (1998a, 1998b, 2010), similarly to Blackfoot (Wiltschko 2010), Dene Suliné (Wilhelm 2008), Inuu-aimun (Gillon 2010), Karitiana (Muller, Storto and Coutinho-Silva 2006), Ojibwe (Mathieu 2012), St'at'imcets (Davis and Matthewson 1999) and Yudja (Lima 2010, 2012, 2013, ms.). Kuikuro (Southern Carib, Brazil) is characterized by its bare arguments, optional plural morphology and the absence of numeral classifiers (Franchetto, Santos and Mehinaku 2007). The central aspect we discuss in this paper is the fact that all nouns can be used as count nouns and that individuation is a context-dependent operation (cf. Rothstein (2010), Lima (2012)). This paper is structured as follows. In section 2 we present some general properties of the Kuikuro language. In section 3 we present a description of the constructions with numerals. In section 4 we present an analysis for individuation in Kuikuro based on Rothstein's (2010) contextual parameter analysis for individuation and counting and Lima's (2010, 2012) analysis for Yudja.

2. KUIKURO: GENERAL PROPERTIES

Kuikuro is a dialect of the Upper Xingu Carib Language (LKAX), the Xinguan Southern Branch of the Carib family (Meira and Franchetto 2005) and it is spoken by 600 Amerindians in Southern Amazonia, living in five villages in the Southeastern part of the Xingu Indigenous Land, north of the State of Mato Grosso.

LKAX is an agglutinative, head final and ergative language. Internal arguments (Pacient/Experiencer of a transitive verb, Actor/Experiencer of an intransitive verb, argument of a postposition or of a noun), always form a phonological unit with their head. All intransitive verbs are inaccusative. The External Argument (external Cause/Source/Agent of a transitive verb) is marked by *heke*, a locative postposition.

20a. kangamuke agu-ki-jü is-ügünü heke
 child thin-VBLZ-PNCT 3-sick. PNCT ERG
 'His sickness made (the) child thin'

20b. kangamuke agu-ti-lü
 child thin- VBLZ-PNCT
 '(The/a) child/children got thin'

20c. kangamuke atsaku-lü
 child run-PNCT
 '(The/a) child/children run(s)/ran'

In the nominal domain, Kuikuro is characterized by bare arguments. That is, nouns are unmarked for number and for definiteness:

21. kanga enge-tagü kangamuke heke
 fish eat-CONT child ERG
 '(The/a/some) child/children is/are eating (the/a/some) fish/es'

As in other number neutral languages, the plural morpheme *-ko* is optional as any noun can be interpreted as singular or plural. Four properties characterize the distribution of this morpheme.

First, the morpheme *-ko* can only occur suffixed to [+animate] nouns; inanimate count nouns cannot be pluralized with *-ko* (22d-22e). Therefore, the plural morpheme is not a grammatical feature that distinguishes count from mass nouns in Kuikuro:

- 22a. kanga-ko
fish-PL ‘fishes’
- 22b. kuge-ko
person- PL ‘people’
- 22c. kangamuke-ko
child- PL ‘children’
- 22d.. * tehu-ko
stone- PL
- 22e. * ehu-ko
canoe- PL

Second, as in classifier languages (cf. Nakanishi and Tomioka 2004, cf. example 23 for Japanese), in Kuikuro, the plural morpheme *-ko* may be suffixed to individual-denoting expressions:

Japanese

23. Taro-tati-wa moo kaetta
Taro-tati-TOP already went home
'The group of people represented by Taro went home already'
(Nakanishi e Tomioka 2004; 124)

Kuikuro

- 24a. Jumu-ko
Jumu-PL
'Extended family of Jumu/the people of Jumu'
- 24b. Brazil-ko
Brazil- PL
'The Brazilian football team'
- 24c. Tute-ko
Tute- PL
'Tute (Aldebaran) and its group of stars (the constellation of Taurus)'

Third, in Kuikuro pluralized nouns cannot co-occur with numerals:

- 25 * tilako kanga-ko
three fish- PL

This property is also observed in classifier languages, such as Chinese. In Chinese the morpheme *-men* cannot co-occur with numerals (cf. Cheng and Sybesma 1999):

Chinese

26. * san-ge haizi-men
three-CL child-men
Cheng and Sybesma (1999; 537)

Fourth, the suffixation of the morpheme *-ko* to unpossessed nouns seems to be a recent process in the Kuikuro language. In interviews, elderly speakers, commenting the “new” language spoken by younger people, argue that *-ko* used to occur only suffixed to: 1) proper nouns (being interpreted as an associative plural (24)); 2) possessed nouns (in order to indicate plurality of possessors (27a-27b)) and 3) verbs (in order to indicate that the internal arguments is a plurality when the internal arguments are coded by the second, third and first person dual inclusive person prefixes (28a-28b, 29a-29b))⁴:

Possessives

- 27a. i-tahaku-gu
2-bow- REL
‘His bow(s)’

- 27b. i-tahaku-gu-ko
2-bow-REL-PL
‘Their bow(s)’

Verbs

- 28a. nhatüi is-ünggü-lü hagu-te
five 3-sleep-PNCT fishing.camp-LOC
‘He slept five (nights) at the fishing camp’
- 28b. nhatüi is-ünggü-lü-ko hagu-te
five 3-sleep- PNCT-PL fishing.camp- LOC
‘They slept five (nights) at the fishing camp’
- 29a. e-ingi-lü iheke titá
2-see- PNCT 3- ERG there
‘He saw you (sing) over there’
- 29b. e-ingi-lü-ko i-heke titá
2-see- PNCT-PL 3- ERG there
‘He saw you (plural) over there’

Another morpheme that refers to quantities is *tuhugu*, which can be combined with [- animate] and mass nouns. As *-ko*, *tuhugu* cannot be combined with nouns in constructions with numerals:

4. *-ko* is not agreement, as shown by the following examples:

i kangamuke(-ko) atsaku-lü leha itsuni-na
child run- PNCT-PL CMPL forest-AL
‘child/children ran to the forest’

ii * kangamuke(-ko) atsaku-lü-ko leha itsuni-na
child run-PNCT-PL CMPL forest- AL
‘child/children ran to the forest’

- 30a tilako nhukau
 three pequi oil
 ‘Three (portions of) pequi oil’
- 30b *tilako nhukau tuhugu
 three pequi.oil quantity
 ‘Three quantities of pequi oil’

Note that *tuhugu* can co-occur with *-ko*, which may suggest that they do not have the same meaning in Kuikuro:

- 31 kanga-ko tuhugu
 fish-PL quantity
 ‘Quantities of (alive) fishes’

Elderly speakers suggest that *tuhugu* could be combined with all nouns (count or mass) while *-ko*, as mentioned before, historically, was only suffixed to verbs, as well as to possessed and proper nouns. Since *tuhugu* can co-occur with *-ko* and since it modifies any noun, we may hypothesize that its meaning is similar to that of the expression quantity of in English (cf. Chierchia 2010), which can combine with count and mass nouns. This hypothesis, however, will be explored in future developments of this work (Franchetto, Santos and Lima, ms.).

3. NUMERALS IN KUIKURO

Numerals in Kuikuro that refer to numbers from one to five and to ten are morphologically simple⁶:

- 32a. aetsi ‘One’
 32b. takeko ‘Two’
 32c. tilako ‘Three’
 32d. tatakegeni ‘Four’
 32e. nhatüi ‘Five’
 32f. timüho ‘Ten’

Number words above six and up to nine are formed by the combination of the numerals from one to five with a deverbal noun meaning ‘the one used to cross to the other side’:

33. tilako inkguge-toho
 three cross-INSTNR
 ‘Eight’

The numerals for eleven to nineteen are formed by the combination of numerals from one to nine and the expression ‘on foot’ (*hügape*), as illustrated below:

5. -Note that this restricted use of *-ko* and *tuhugu* is not only described in interviews but also documented in spontaneous speech and written texts produced by elderly speakers (above 40 years old).

6. These number words do not show synchronically any internal morphological structure; however it would be possible to hypothesize that the plural suffix *-ko* is part of morphology of the numerals *takeko* ‘two’ and *tilako* ‘three’ and that the root *imü*, ‘face’ is part of numeral word *timüho* ‘ten’.

- 34a. tilako hügape
three on.foot
'Thirteen'
- 34b. tilako inkguge-toho hügape
three cross- INSTNR on.foot
'Eighteen'

The number twenty is denoted by the expression *tatute hügape* ('all on.foot') and above it there are no number words or expressions.

Numerals, like postpositions and adverbs, can be 'nominalized' by means of the suffix *-ngo* (*tilako-ngo*). Ordinal numbers occur as genitive ('possessive') constructions whose head is a nominalized numeral root⁷:

35. anetü etila-ngo-gu
chief three-NMLZ-REL
'The third chief'

When numerals combined with nouns or NPs they can occur before the noun/noun phrase or in the end of the sentence:

- 36a. konige tilako tahitse ingi-lü u-heke
yesterday three macaw see-PNCT 1- ERG
'Yesterday I saw three macaws'
'Yesterday I saw macaws three times'
- 36b. konige tahitse ingi-lü u-heke tilako
yesterday macaw see- PNCT 1- ERG three
'Yesterday I saw three macaws'
'Yesterday I saw macaws three times'
- 37a. konige tilako nhukau ingi-lü u-heke
yesterday three pequi.oil see- PNCT 1- ERG
'Yesterday I saw three (bottles) of pequi oil'
'Yesterday I saw (bottles) of pequi oil three times'
- 37b. konige nhukau ingi-lü u-heke tilako
yesterday pequi.oil see- PNCT 1- ERG three
'Yesterday I saw three (bottles) of pequi oil'
'Yesterday I saw (bottles) of pequi oil three times'

7. The numeral root *etila* cannot occur as free form and it is clearly related to the number word *tilako* ('three'); the latter could be analyzed as *(e)tila-ko* (three-PL), but its internal structure is synchronically opaque (see note 5).

38. konige tilako nhukau ingü ingi-lü u-heke
 yesterday three pequi.oil container see- PNCT 1- ERG
 ‘Yesterday I saw three bottles of pequi oil’
 # ‘Yesterday I saw bottles of pequi oil three times’

Note that none of the sentences above can be interpreted as expressing event quantification. That means, the sentences in 36 cannot mean “I saw (a/some) macaw(s) three times” and the sentences in (37) and (38) cannot be interpreted as “I saw bottles of pequi oil three times”. In order to derive this interpretation, numerals must occur before the VP and must combine with the post-VP adverb *ihsundu*, which can be roughly translated as ‘quantity, unit’⁸:

39. ige ngune-mbeke tilako u-hülu ihsundu
 DPROX moon-TEMP three 1-walk unit
 ‘I traveled three times this month’
40. konige tilako tahitse ingi-lü hisundu u-heke
 yesterday three macaw see- PNCT unit 1- ERG
 ‘I saw (a/the/some) macaw three times’
 # ‘I saw three macaws’

In the following two examples, both the combinations of a numeral with an NP and the combination of a numeral with a VP are attested in the same sentence:

41. konige tilako nhukau ingi-lü u-heke takeko ihsundu
 yesterday three pequi.oil see- PNCT 1- ERG two unit
 ‘Yesterday I saw three (bottles) of pequi oil two times’
 # ‘Yesterday I saw two (bottles) of pequi oil three times’
42. konige tahitse tilako-ngo-ko ingi-lü u-heke takeko ihsundu
 yesterday macaw three-NMLZ-PL see- PNCT 1- ERG two unit
 ‘Yesterday I saw three macaws two times’
 # ‘Yesterday I saw two macaws three times’

4. COUNT/MASS DISTINCTION IN KUIKURO: CONSTRUCTIONS WITH NUMERALS

As in other number neutral languages such as Dene Suliné (Wilhelm 2008) and Yudja (Lima 2010, 2012) in Kuikuro count nouns can be directly combined with numerals without intervening classifiers or measure phrases:

8. An exception to this rule is the idiomatic expression ‘nhatüi is-üñgü-lü’ presented in the example (28) reproduced below:

i nhatüi is-üñgü-lü hagu-te
 five 3-sleep- PNCT fishing.camp-LOC
 ‘He slept five (nights) at the fishing camp’

In this example the numeral is combined with the VP (a man slept five times) and the post-VP adverb *ihsundu* is not included in the sentence. That is because ‘nhatüi isüñgü-lü’ is an idiomatic expression to express that someone stayed away from the village in a relatively long interval (that is, *nhatüi* ‘five’ here does not mean literally the number five).

43. Mutua heke leha tahitse ingi-pügü tilako
 Mutua ERG CMPL macaw see-PERF three
 ‘Mutuá saw three macaws’

As in Yudja (Lima 2010, 2012) container or measure constructions are optional in constructions with mass nouns in Kuikuro, as long as a unit of individuation is salient in the context as presented in (44a) and (44b) and also in (44b) below:

- 44a. tilako nhukau tingü ata
 three pequi.oil bottle in
 ‘Three bottles of pequi oil’

- 44b. tilako nhukau
 three pequi.oil
 lit: ‘three bottles of pequi oil’

In elicitation session with three Kuikuro *speakers*⁹, the consultants included a container word in constructions with numerals and mass nouns when the sentence is out of context. All the sentences produced by the consultants included the container noun *ingü* ‘casing, container’, which is compatible with liquid and non-liquid substances:

- 45a. tilako u-ngipi nhukau **ingü**
 three 1-have pequi.oil container
 ‘I have three bottles of pequi oil’

- 45b. aetsingo **ingü-pe** nhukau-pe tu-nümingo leha u-heke
 one container-EX pequi.oil-EX give-FUT CMPL 1-ERG
 ‘I will give you one bottle of pequi oil’

- 45c. ama heke nhatüi nhukau **ingüN-te-pügü**
 mother ERG five pequi.oil container-VBLZ-PERF
 ‘My mother gave (to someone) five bottles of pequi oil’

- 45d. aütü heke tilako agahü **ingü** tu-nügü apa-inha
 Aweti ERG three salt container give-PNCT father-DAT
 ‘Aweti gave three packages of salt to my father’

In the examples above, *ingü* ‘casing, container’ stands for different container units, such as bottles (45a-45c) and packages (45d), in different contexts. Note that *ingü* can also be combined with count nouns such as *tapü* ‘foot’ meaning ‘shoes’ (literally, the foot’s casing/container):

46. u-tapü-gü ingü
 1-foot-REL casing
 ‘My shoes (lit.: casing/clothes for foot)’

9. Three male Kuikuro speakers (25, 29 and 45 year old) participated in this elicitation session. Their task was based on a production task described by Semenza *et al.* (1997; 673). In Semenza *et al.* (1997)’s study, a consultant had to build a sentence from a target noun (count or mass) and ‘a semantically associated noun’ (i.e. ship/sea, water/glass). In Kuikuro, speakers had to construct a sentence using a target noun (a notional mass noun) and a numeral. The sentences provided by the consultants are presented in 45.

As mentioned in the introduction, cross-linguistically, either a classifier or a container/measure phrase is required in constructions with numerals and mass nouns. In Kuikuro there are no numeral classifiers and container nouns such *ingü* ‘casing/container’ are optional. We will exclude the possibility of *ingü* being analyzed as a numeral classifier, given that Kuikuro has no classifier system and, therefore, no numeral classifiers. Moreover, the inherently relational or depended (obligatory ‘possessed’) noun *ingü* can occur by itself combined with possessives, as illustrated below (if *ingü* was a classifier, that would not be possible):

- 47a. u-ingü
1S-casing/container
‘My clothes’
- 47b. kagaiha ingü
white.people casing/container
‘Clothes of white people’
- 47c. kagaiha gitü-gü ingü
White.people head-REL casing
‘White people’s hat’

In this paper following previous work in other number-neutral languages and recent hypothesis on individuation and counting (Kratzer 2008, Rothstein 2010, Chierchia 2010, Lima 2010, 2012, 2013) we will claim that nouns in Kuikuro denote kinds by default and (cf. Krifka 1995, Chierchia 1998) and individuation/atomization is a context-dependent operation. Before motivating the context-dependent atomic function needed for individuation and counting in Kuikuro, we will motivate why the basic denotation of nouns is kinds in this analysis.

4.1. Motivating the analysis of bare nouns as kind-referring terms

Let us begin with the assumption that the basic denotation of a bare noun is kinds. A first piece of evidence in favor of this assumption is typological. It has been observed that in languages that license the use of bare nouns as arguments, bare nouns can be used to refer to kinds (Krifka 1995; 399; see also Chierchia 1998b, Müller 2002, Pires de Oliveira and Rothstein 2011, among many others) as illustrated below in 48a in contrast to 48b (reference to subkinds) and 48c (reference to specimens):

Kinds - Chinese

- 48a. xiong jue zhong le
bear vanish kind ASP
‘The bear is extinct’

Subspecies - Chinese

- 48b. san zhi xiong
three CL bear
‘Three bears’ (objects)

Specimens - Chinese

- 48c. san zhong xiong
three CL bear
'Three bears' (species)
(Krifka 1995; 398-399 – examples 1a, 1d, 1e)

A second piece of evidence is conceptual in nature. One may argue that reference to kind is primitive for ontological reasons. According to Krifka (1995) “kinds seems to be ontologically prior to specimens; if we want to call some real object a bear we have to relate this object to the kind *Ursus*, whereas it is not necessary to have some real specimens in mind in order to talk about the kind *Ursus*” (Krifka 1995; 399). From this point of view, reference to kind is given for free, and additional semantic operations are required to get a noun to refer to objects and subkinds (cf. Krifka 1995, Kratzer 2008). Note that there is a one to one relation between kinds and properties. To a given kind k , there corresponds a property P which is defined as the function that maps any world w to the set of individuals that are specimens of k in w , which is the set of individuals that belong to $k(w)$ (cf. Chierchia 1998a, 1998b, 2010). In the rest of this paper, we will refer to kinds in the metalanguage using capitalized nouns. For instance, DOG is the kind of dogs, i.e. a function from a world w to the sum of all dog individuals in w . From a kind k , we can derive the set of individuals that are specimens of k in a world w as in (49), and we can derive the property of being a specimen of k as in (50):

49. $\lambda x. x \leq \text{DOG}(w)$

50. $\lambda x. \lambda w. x \leq \text{DOG}(w)$

Carlson (1977) argue that there are grammatical and lexical phenomena that are sensitive to the intuitive ontological distinction between object denoting DPs (e.g. ‘The lion escaped yesterday from the Hellabrunn zoo’ - Krifka *et al.* 1995; 5 – example 7a) and kind denoting DPs (The lion is a predatory cat’ - Krifka *et al.* 1995; 5 – example 5a). One of these phenomena is that some predicates, such as *become extinct*, are only compatible with kind denoting DPs. For example, *become extinct* is compatible with a kind denoting subject but not with an object (specimen) denoting subject:

51. The lion will become extinct soon.
52. *Simba will become extinct soon.
(Krifka *et al.* 1995; 10 – example 23a)

The same can be observed in Kuikuro (53). The bare noun *tahitse* ‘macaw’ is used to denote a kind (MACAW), since it occurs as the subject of the kind predicate *etünügü* ‘become extinct’. That this predicate selects kind denoting subjects is confirmed by the fact that it is ungrammatical with proper names, as illustrated in (54):

Kuikuro

53. tahitse-pe etü-nügü leha
macaw-EX extinguish-PNCT CMPL
'Macaw is extinct'
54. *Simba etü-nügü leha
Simba extinguish-PNCT CMPL

From these examples and the data that we discussed in section 3, we conclude that noun roots refer to kinds in Kuikuro. In counting scenarios, we have seen that no additional overt morphology is needed to license a property of individuals interpretations for mass nouns. This raises the question about how the kind-referring interpretation of nouns is related to the property of individuals reading of the nouns. Should we assume that bare nouns are lexically ambiguous? Or should we rather posit a basic denotation and derive from it the other two? In the rest of this section, we will argue in favor of the second answer. We will argue in favor the hypothesis that the atomic function is manifested by a functional head in Kuikuro.

4.2. The atomic function hypothesis and the Distributed morphology framework

We propose that bare nouns in Kuikuro are morphologically complex. Following much work in Distributed Morphology (Hale and Marantz 1993, Halle and Marantz 1999, Embick and Noyer 2001, among many others) and previous work on word formation in Kuikuro (cf. Franchetto 2006, Santos 2007, 2008, Franchetto and Santos 2010) we adopt the working hypothesis that all lexical items are formed by combining category neutral roots with category-defining functional heads. In the distributed morphology framework, roots will surface in the syntax as lexical categories (nouns, verbs, adjectives, etc) only after being categorized. Therefore, lexical categories will always be syntactically complex. That is, nouns (and other lexical categories) are minimally formed by a root and an abstract morpheme as defined below:

“Abstract Morphemes: These are composed exclusively of non-phonetic features, such as [Past] or [pl], or features that make up the determiner node D of the English definite article eventuating as the.

Roots: These include items such as $\sqrt{\text{CAT}}$, $\sqrt{\text{OX}}$, or $\sqrt{\text{SIT}}$, which are sequences of complexes of phonological features, along with, in some cases, non-phonological diacritic features. As a working hypothesis, we assume that the Roots do not contain or possess grammatical (syntactic-semantic) features.”
(Embick and Noyer 2007)

In other words, the basic assumption of the distributed morphology is that roots never appear bare, without being combined with a functional head. This idea is formalized by Marantz (1995 *apud* Embick and Noyer 2007) as the ‘categorization assumption’:

Categorization assumption: roots cannot appear without being categorized; Roots are categorized by combining with category-defining functional heads (Marantz 1995, *apud* Embick and Noyer 2007)

Under this view, roots will be an open class of language-specific ‘combinations of sound and meaning’ (Embick and Noyer 2007). Cross-linguistically the roots that will become nouns in the syntax will vary but “the features that make up abstract morphemes are universal” (Embick and Noyer 2007). Roots always will be categorized by functional heads, which are universal and are composed of non-phonetic features. Following this framework, in order to form the bare nouns *nhukau* ‘pequi oil’ and *tahitse* ‘macaw’ one needs to combine the root $\sqrt{(\text{" tahitse" })}$ and $\sqrt{(\text{" nhukau " })}$ with the nominal functional head *n*, as illustrated in (55):

- 55a [nP n $\sqrt{(\text{" tahitse" })}$]
55b [nP n $\sqrt{(\text{" nhukau" })}$]

One can make a cross-linguistic argument in favor of the morphological decomposition of bare nouns; in classifier languages, classifiers are overt manifestations of this functional head *n*. In some languages, such as English (Kratzer 2008) and Yudja (2012, 2013) these are covert operations: in English, as suggested by Kratzer (2008), covert ‘classifiers’ (silent functional heads) will be combined with root noun meanings in order to derive nouns and its different interpretations (kinds, subkinds, objects)¹⁰:

56a $[[\sqrt{(" zebra")}]] = \text{‘zebra’}$

56b $[[\text{CL}_{\text{ind}}]] = \lambda x \lambda y [[\text{kind}(x) \ \& \ \text{individual}(y) \ \& \ y \leq x]]$

56c $[[\text{CL}_{\text{kind}}]] = \lambda x \lambda y [[\text{kind}(x) \ \& \ \text{kind}(y) \ \& \ y \leq x]]$

(Kratzer 2008; 272 – examples 2a and 2b)

In this example, Kratzer is illustrating that a noun like *zebra* can denote a set of individual zebras (CL_{ind}) as in ‘This zebra has not been fed’ (56b, Kratzer 2008; 272) or a set of subspecies of the species ‘zebra’ (CL_{kind}) as in ‘This zebra is almost extinct’ (56c, Kratzer 2008; 272). Following Krifka (1995), for Kratzer nouns are semantically complex: they are formed by a root noun meaning and a functional head. The proposal presented in this paper make a similar claim; nouns in Kuikuro are complex: nouns are formed by combining a root noun meaning (kind-denoting) with a silent functional head that denotes a context-dependent atomic function.

Similarly to Kratzer (2008)’s proposal for English and Lima (2012)’s proposal for Yudja, we proposed that category neutral roots like *nhukau* ‘pequi oil’ and *tahitse* ‘macaw’ denote kinds. We take it that the basic denotation of the bare noun *tahitse* ‘macaw’ is the kind MACAW, as in (57a), or equivalently (57b). The same holds for a substance denoting noun such as *nhukau* ‘pequi oil’ (58):

57a. $[[\sqrt{(" tahitse")}]] = \lambda w. \text{MACAW}(w)$

57b. $[[\sqrt{(" tahitse")}]] = \text{MACAW}$

58a. $[[\sqrt{(" nhukau")}]] = \lambda w. \text{PEQUI OIL}(w)$

58b. $[[\sqrt{(" nhukau")}]] = \text{PEQUI OIL}$

To turn *tahitse* into a noun denoting a property of objects, we must map the kind MACAW or PEQUI OIL to the property of being an individual that is an atomic part of it. This property is represented in (57c) and (58c) for *tahitse* ‘macaw’ and *nhukau* ‘pequi oil’, respectively. We assume that we have access to a function AT that maps an individual *x* to the truth value 1 if and only if *x* is atomic:

57c. $\lambda x. x \leq \text{MACAW}(w) \ \& \ \text{AT}(x)$

58c. $\lambda x. x \leq \text{PEQUI OIL}(w) \ \& \ \text{AT}(x)$

We must then define a function that maps kinds like (57b-58b) to properties of atoms like (57c-58c). Such a function is defined in (59). Let us call it KO, for Kind to Object (cf. the realization function R in Krifka *et al.* 1995; 66). The result of applying $[[\sqrt{(" tahitse")}]]$ or $[[\sqrt{(" nhukau")}]]$ in (46b-47b) to KO is the property of being an atomic part of the kind MUTUM or PEQUI OIL, as illustrated in (60) and (61), respectively:

59. $KO = \lambda k. \lambda x. \lambda w. k \in K \ \& \ x \leq k(w) \ \& \ AT(x)$
60. $KO([\sqrt{(" \text{ tahitse" })}]) = \lambda x. \lambda w. \text{MACAW in } K \ \& \ x \leq \text{MACAW} (w) \ \& \ AT(x)$
61. $KO([\sqrt{(" \text{ nhukau" })}]) = \lambda x. \lambda w. \text{PEQUI OIL in } K \ \& \ x \leq \text{PEQUI OIL} (w) \ \& \ AT(x)$

In the next section we will assume that AT is simply a relation between contexts and individuals. We will go back now to the issue of the context sensitivity of atomicity: why is it the case that units of counting are context sensitive with some NPs in Kuikuro, but not with others?

4.3. On a contextual parameter for counting in Kuikuro

The literature on countability relies on the assumption that counting is counting atoms. A first and central question to ask is how we define atoms. When I say ‘There are three cats on the bed’ the things that are counted are cat-atoms. Nouns like *cat* have natural atoms in their denotation. There is a family of easily identifiable properties that individual cats always have, in every context: they have a head, a body, four legs, a tail, etc. Because we know these properties, what counts as a cat and what counts as a body-part of a cat is stable across contexts. Other count nouns like *wall* have a less straightforward denotation.

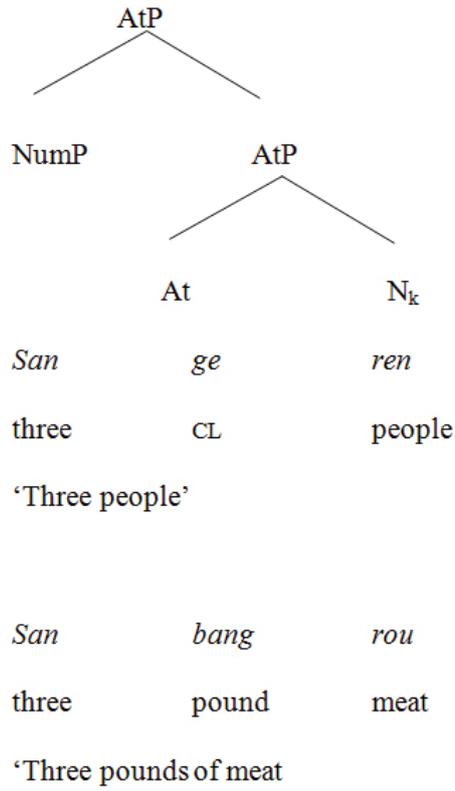
Take as an example a medieval castle (based on Rothstein 2010; 374). There is a big building in the middle, which is surrounded by a thick wall in form of a square. Now, we might refer to this wall as ‘the wall of the castle’, in which case we count it as a wall-atom. Or we might refer to parts of this wall as walls themselves, as when we talk about the northern wall of the castle. Of course, we cannot mix these different ways of counting walls. That is, the ‘northern wall’ and the ‘wall of the castle’ cannot be counted as two walls in the same context. For instance, if someone asks the (funny) question ‘How many walls are there in the castle?’ we cannot answer ‘there are two walls, the northern wall and the wall of the castle’. This example shows that wall-atoms are not natural atoms as they vary with the context.

Rothstein (2010) discusses the idea that we do not need natural atoms for counting. In the author’s proposal, the basic denotation of a noun like *wall* (henceforth the root noun meaning) is a set of wall-atoms of different kinds, possibly overlapping. For instance, the root noun meaning of *wall* in our example includes both the *wall* of the castle and the northern wall of the castle. We cannot count the members of the root noun meaning of wall because the set includes overlapping atoms of different kinds. As a consequence, before we can count *walls*, i.e. before we can combine a numeral with the noun *wall*, we need to select a type of wall-atoms to be counted.

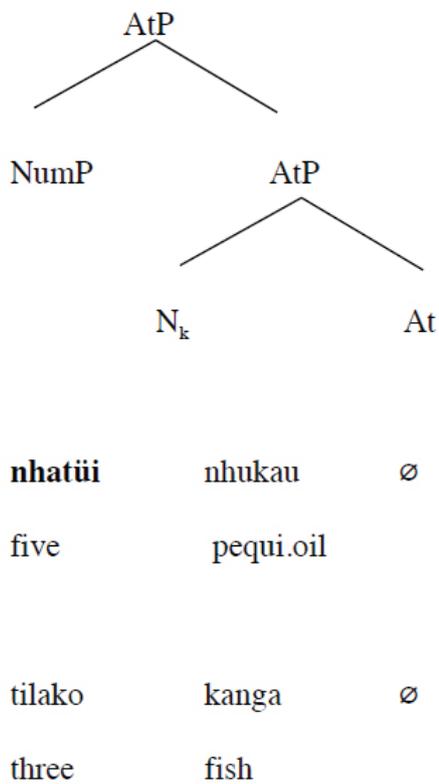
How are atoms selected from a root meaning according to Rothstein (2010)? Rothstein introduces the notion of a context as a set of objects. A context *k* is a subset of the universe of discourse *M*. A context is a set of objects of all kinds (walls, fences...). Given any root noun meaning *Nroot* and a context *k*, the intersection $Nroot \cap k$ is a set of *N*-atoms of the same kind. This entails that for any $x, y \in Nroot \cap k$, if $x \neq y$ then *x* and *y* do not overlap. A function $COUNT_k$ is used to select atoms of a particular kind in a root noun meaning *Nroot*.

For Rothstein, count nouns derived with $COUNT_k$ are not sets of individuals, but sets of pairs of an individual and the context *k*, i.e. the context in which the first member of the pairs count as atoms.

65. Chinese (Atomic function mapping)



66. Kuikuro (Atomic function mapping)



While in classifier languages there are overt classifiers for both count and mass nouns, in Kuikuro this operation is going to be denoted by a silent functional head. To say that the same atomic function is needed for count and mass nouns is not to say that there is absolutely no linguistically relevant difference between mass and count nouns. One difference that was observed relates to the influence of context on the determination of units of counting (atoms) for a given noun. For notionally count nouns like macaw, it appears that what counts as an atom is stable across contexts. However, for notionally mass nouns like pequi oil, what counts as an atom varies across contexts of utterance. Thus, this analysis predicts that the mapping from kinds to properties of individuals is an independent grammatical operation in the sense that is not part of the root noun meaning.

FINAL REMARKS

In this paper we discussed the processes of individuation and counting in Kuikuro (Southern Carib, Brazil). Kuikuro is a number-neutral language characterized by: 1) bare arguments; 2) optional plural morphology; 3) absence of numeral classifiers. Following Lima (2012, 2013)'s analysis for Yudja, we have argued that nouns in Kuikuro denote kinds and other types of denotations are derived. In order to interact with the count system (numerals, for example), a context-dependent individuation operation (cf. Rothstein (2010)) is required. Our hypothesis predicts that all nouns are morphologically complex: they are formed by combining a root noun meaning (kind-denoting) with a silent functional head that denotes the atomic function. What distinguishes count nouns from mass nouns is the fact that the atoms in the extension of count nouns are stable across contexts; while the atoms in the extension of mass nouns are unstable, i.e., vary across contexts.

Following Chierchia (2013) and Lima (2013a, 2013b, ms.) this analysis claims that despite the variation in the grammar of counting, classifier languages such as Mandarin and number-neutral languages such as Yudja and Kuikuro are similar in the sense that they are both kind-denoting and that numeral classifiers or null classifiers (or 'logical classifiers', in Chierchia (2013)'s terms) denote an atomic function that maps kinds to properties of individuals and makes it possible for nouns to interact with the count system.

A DISTINÇÃO CONTÁVEL-MASSIVO EM KUIKURO: INDIVIDUAÇÃO E CONTAGEM

RESUMO

Neste artigo analisamos o processo de atomização e contagem em Kuikuro (Carib, Brasil). Kuikuro é uma língua de número-neutro caracterizada pela ausência de classificadores numerais. Hipotetizamos neste artigo que o processo de atomização em Kuikuro é realizado através de uma operação dependente do contexto (cf. Rothstein (2010), Lima (2012)).

PALAVRAS-CHAVE: Kuikuro, distinção contável-massivo, individuação, numerais, contagem.

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INTERLINEAR GLOSSES (KUIKURO)

1	first person
2	second person
3	third person
AL	alative
CMPL	completive (aspect)
DAT	dative
DPROX	proximal deictic
DIM	diminutive
ERG	ergative
EX	nominal suffix with past meaning, detached
FUT	future
INSTNR	instrumental nominalizer
LOC	locative
NMLZ	nominalizer
PERF	perfective
PL	plural
PNCT	punctual (aspect)
QUANT	quantity
REL	relational ('possession' suffixes)
Temp	temporal
VBLZ	verbalizer