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ON THE SEMANTICS OF NUMERAL REDUPLICATION IN HAYA: BETWEEN DISTRIBUTIVITY AND PLURACTIONALITY [1]

Abstract: *This paper provides a first description and analysis of numeral reduplication in Haya, a Bantu language. In literature, numeral reduplication is generally analyzed as a marker of either distributivity or event plurality (pluractionality) in the languages where it is attested. Based on empirical data and the application of standard diagnostics, this study shows that (i) the distributive readings associated with numeral reduplication differ from those conveyed by markers of distributivity, and (ii) numeral reduplication in Haya functions primarily as a marker of pluractionality.*

Keywords*: numeral reduplication, distributivity, pluractionality, Haya, Bantu*

SUR LA SÉMANTIQUE DE LA RÉDUPLICATION NUMÉRALE EN HAYA : ENTRE DISTRIBUTIVITÉ ET PLURACTIONALITÉ

Résumé : *Cet article propose une première description et analyse de la réduplication numérale en haya, une langue bantoue. Dans la littérature, la réduplication numérale est généralement analysée comme un marqueur soit de distributivité, soit de pluralité d'événements (pluractionalité) dans les langues où elle est attestée. Sur la base de données empiriques et de l'application de diagnostics standards, cette étude montre que (i) les lectures distributives associées à la réduplication numérale diffèrent de celles véhiculées par les marqueurs de distributivité, et (ii) la réduplication numérale en haya fonctionne principalement comme un marqueur de pluractionalité.*

Mots-clés *: réduplication numérale, distributivité, pluractionnalité, haya, bantou*

1. Introduction

Our study focuses on the semantics of numeral reduplication (henceforth NumRed) in the Haya language[2]. NumRed is highly productive in this language, and our data come from both elicited and naturalistic sources. Specifically, the data were first collected from one native speaker and subsequently verified and confirmed by four others.

In this language, a numeral generally follows the noun phrase (NP) it modifies and bears the same nominal classifier (CL) as the noun (Byarushengo et al. 1977). This is illustrated in example (1), where a classifier (CL14) appears both on the numeral and on the

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[2] Haya, also called Kihaya or Ruhaya, is a Bantu language. It is spoken primarily in northwestern Tanzania, especially around the Kagera region on the western shores of lake Victoria.

noun phrase it modifies. The same sentence with a reduplicated numeral, as shown in (2), is also possible[1].

(1) a-ba-kazi ba-ka-kwat-a o-bu-naana bu-bili
PP-CL2-woman 3PL-PST-hold-FV PP-CL14-banana CL14-two
'The women held two bananas.'

(2) a-ba-kazi ba-ka-kwat-a o-bu-naana bu-bili bu-bili
PP-CL2-woman 3PL-PST-held-FV PP-CL14-banana CL14-two CL14-two
Lit. 'The women held *two two* bananas.'

The sentence in (2) gives rise to three distributive readings listed below in (3).

(3) i. Participant distribution 'Each woman held two bananas.'
ii. Temporal distribution 'The women held two bananas at different times.'
iii. Spatial distribution 'The women held two bananas in different locations.'

If the sentence in (2) gives rise to the three distributive readings in (3) — participant distribution, temporal distribution, and spatial distribution —, can numeral reduplication be considered a marker of distributivity? Are these distributive readings consistently present in all contexts and with any arguments or verbs? Our goal is to explore these questions in detail, and we will demonstrate that numeral reduplication in Haya primarily marks pluractionality rather than distributivity. We will argue that distributivity arises as a consequence of the separation of events across participants, rather than being the core function of NumRed.

The article is organized as follows: section 2 addresses the syntactic aspects of numeral reduplication in Haya. Section 3 delves into the semantics of numeral reduplication in Haya, analyzing its function and different readings. Finally, Section 4 concludes the article by summarizing our findings and discussing their implications for the cross-linguistic study of numeral reduplication, distributivity and pluractionality.

2. On the syntax of numeral reduplication in Haya

In this language, a numeral can be reduplicated regardless of its position in the sentence or of the syntactic element it modifies: whether it is the subject, the object, or both. To illustrate the productivity of this phenomenon, we provide two examples for each syntactic position. The example in (1) illustrates a case where the numeral modifies the object or appears in the object position. Below, in (4) and (5), are two examples where a reduplicated numeral modifies a subject.

(4) a-ba-shaija ba-shatu ba-shatu ba-ka-lim-a e-n-dim-iro
PP-CL2-man CL2-three CL2-three 3PL-PST-dig.up-fv PP-CL9-field-LOC
Lit. 'Three three men dug up the field.'

[1] Abbreviations : CL = classifier (class numbers follow the system established in Byarushengo et al. (1977: 8-9)) ; DEM = demonstrative ; FV = final vowel ; GEN = genetive ; LOC = locative ; PL = plural ; PR = present progressive ; PST = past ; PP = preprefix.

(5)	a-ba-kazi	ba-bili	ba-bili	ba-ka-sharur-a	e-m-perege
	PP-CL2-woman	CL2-two	CL2-two	3PL-PST-harvest-FV	PP-CL10-bean
Lit.	'Two two women harvested beans.'				

In sentences (4) and (5), distributivity can be either temporal or spatial. In the case of temporal distribution, the agents ('three men' in example (4) and 'two women' in example (5)) perform the action for a certain period, after which another group of agents, of the same number, takes over and performs the same action, and so on. In contrast, with spatial distribution, groups of agents ('three men' in example (4) and 'two women' in example (5)) carry out the action in different locations, either simultaneously or at separate times.
The examples in (6) and (7) illustrate cases where a reduplicated numeral can also appear in both the subject and the object positions.

(6)	a-ba-shaija	ba-shatu	ba-shatu	ba-ka-shokor-a
	PP-CL2-man	CL2-three	CL2-three	3PL-PST-dig-FV
	e-bi-ina	bi-nai	bi-nai	
	pp-CL8-hole	CL8-three	CL8-three	
Lit.	'Three three men dug four four holes.'			

(7)	a-ba-kazi	ba-bili	ba-bili	ba-ka-sharur-a
	PP-CL2-woman	CL2-two	CL2-two	3PL-PST-harvest-FV
	a-ma-gunia	ga-tanu	ga-tanu	g'-e-m-perege
	PP-CL6-sack	CL6-five	CL6-five	GEN-PP-CL10-bean
Lit.	'Two two women harvested five five sacks of beans.'			

The set of sentences (4-7) presented in this section involves only transitive verbs. It is worth mentioning that the phenomenon of numeral reduplication is also possible with intransitive verbs, as illustrated by the following examples (8-9).

(8)	a-ba-isiki	ba-shatu	ba-shatu	ni-ba-zin-a
	PP-CL2-girl	CL2-three	CL2-three	PR-3PL-dance-FV
Lit.	'Three three girls are dancing.'			

(9)	e-Ø-nyonyi	i-bili	i-bili	ni-zi-hoy-a
	PP-CL4-bird	CL4-two	CL4-two	PR-3PL-sing-fv
Lit.	'Two two birds are singing.'			

In this section, we have discussed the syntactic positions in which a numeral can be reduplicated, and the data shows that it is possible in the object position, the subject position, or both simultaneously. In the next section, we will focus on the semantic aspects of this phenomenon.

3. On the semantics of numeral reduplication

In this section, we analyze the semantics of reduplicated numerals in order to determine their grammatical function. This phenomenon has been discussed in the literature as either marking distributivity or pluractionality (Gil 1982, 1988; Farkas 1997; Balusu 2006; Kuhn 2019; Cabredo & Laca 2012; Cable 2014; Henderson 2014; Donazzan & Müller 2015 ; Corr

2022; Knežević & Bedar 2024; Bedar & Allawama 2024, among others). We seek to test these two hypotheses in light of our data and contribute new insights from a typological perspective. While the analysis we propose is not entirely novel, as it draws on diagnostic tools used in previous studies (see Bedar & Allawama 2024, and references therein), the new data and results will provide a fresh contribution to the study of the semantics and typology of this phenomenon. By applying four standard diagnostics presented in the subsections below, we will argue that reduplicated numerals are in fact markers of pluractionality, rather than markers of distributivity.

3.1. Only temporal distributivity within a singular argument

We show in this section that sentences with a reduplicated numeral only yield a temporal distributivity when the verb's argument (internal or external) is singular. As a reminder, the sentence in (2) with a plural subject and a reduplicated numeral modifying the object gives rise to three distributive readings: participant distribution, temporal distribution, and spatial distribution. We now take the same sentence in (10), but this time with a singular external argument (subject).

(10)	o-mu-kazi	a-kwat-a	o-bu-naana	bu-bili	bu-bili
	PP-CL1-woman	3SG-hold-FV	PP-CL14-banana	CL14-two	CL14-two
Lit.	'A woman holds two two bananas.'				

For this sentence, our informants were asked for their judgment on the three distributive readings below in (11), but only temporal distributivity was accepted, while the two others were systematically rejected.

(11)	Temporal distribution	'A woman holds two bananas at each different time.'
#	Participant distribution	'Each woman holds two bananas.'
#	Spatial distribution	'A woman holds two bananas in each different location.'

The only reading accepted by our informants is the temporal distribution reading, because it implies that the subject (a woman) performed multiple actions of '*holding two bananas*' at different time intervals, and this refers to pluractionality. The distributive reading over participants is not possible because there is only one participant (a woman), and spatial distribution is also not possible because there is only one participant. If we can imagine a scenario where the subject (a woman) *holds two bananas* in different locations, this is only possible if the actions are performed at different times, which amounts to temporal distribution and refers to event-plurality. The results of this diagnostic confirm those observed for this phenomenon in other languages, such as Kabyle Berber (Knežević & Bedar 2024) and Jordanian Arabic (Bedar & Allawama 2024).

3.2. Plurality requirement

The plurality requirement of distributive numerals has been widely discussed in the literature (Balusu 2006; Knežević 2015; Knežević and Demirdache 2018; Knežević and Bedar 2024; Bedar and Allawama 2024, among others). It concerns whether the participants (subjects or objects) introduced by a reduplicated numeral (RedNum) must vary across events or may

remain identical. For instance, '*two two bananas'* in object position can mean either that different bananas are involved in each event or that the same two bananas recur throughout. Our analysis shows that distinct bananas are required in each event, so that the cumulative number of participants always exceeds the numeral's specified quantity. As argued by Choe (1987), the reduplicated numeral must be an indefinite expression denoting an explicit quantity, which enforces participant variation across events. The use of a definite determiner such as *bulinya* 'those' within the reduplicated numeral, as in (13), is ungrammatical because it implies reference to the same pair across all events, thus violating the plurality requirement.

(12)	a-ba-kazi	ni-ba-kwat-a	bu-linya	bu-nana	bu-bili
	PP-CL2-woman	PR-3PL-hold-FV	CL14-dem	CL14-banana	CL14-two
	'The women are holding those two bananas.'				

(13)	* a-ba-kazi	ni-ba-kwat-a	bu-liinya	bu-nana
	PP-CL2-woman	PR-3PL-hold-FV	CL14-DEM	CL14-banana
	bu-bili	bu-bili		
	CL14-two	CL14-two		
Lit.	'The women are holding those two two bananas.'			

3.3. Non-exhaustive and non-atomic distributivity

In this section, we show that the distributivity marked by the universal distributive quantifier *buli* 'each/every' is different from that marked by a reduplicated numeral. More specifically, the distributivity marked by a distributive quantifier is always exhaustive and atomic, whereas that marked by a reduplicated numeral can be non-exhaustive and non-atomic (Matthewson 2000; Knežević 2015; Knežević & Demirdache 2018; Bosnić et al. 2022; Bedar & Allawama 2024).

Exhaustive distributivity means that the predicate must apply to all individuals in the domain, without exception. In the example '*each woman held two bananas*', illustrated in Figure 1 below, this implies that every woman involved in the event satisfies the condition of '*holding two bananas'*. Atomic distributivity, on the other hand, requires that distribution applies to minimal individual entities rather than to subgroups. Thus, in the same example, the interpretation is computed *woman by woman*, rather than by groups of women *collectively holding two bananas*.

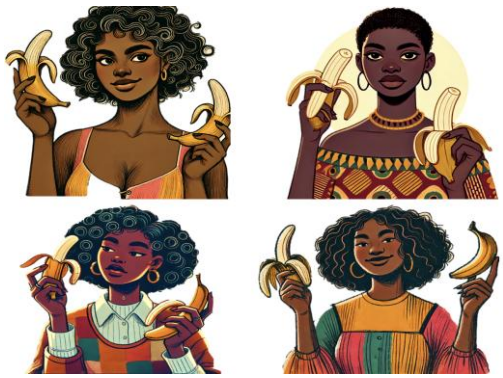

Figure 1 : Exhaustive & Atomic Distributivity Scenario

This scenario is accepted both in sentences involving a reduplicated numeral and in those involving the distributive quantifier *buli* 'each', as in (14-15). We will see in the next two subsections that scenarios where distributivity is non-exhaustive or non-atomic are only possible in sentences involving a reduplicated numeral as (14), but never in sentences with the quantifier *buli* 'each' as (15).

(14)	a-ba-kazi	ba-ka-kwat-a	o-bu-naana	bu-bili	bu-bili
	PP-CL2-woman	PL-PST-hold-FV	PP-CL14-banana	CL14-two	CL14-two
	'The women held two two bananas.'				

(15)	buli	mu-kazi	a-kwat-a	o-bu-naana	bu-bili
	Each/every	CL1-woman	3SG-hold-FV	PP-CL14-banana	CL14-two
	'Each woman held two bananas.'				

These two sentences in (14-15) will be used for judgment tests of scenarios illustrating non-exhaustive distributivity as well as non-atomic distributivity.

3.3.1. Non-exhaustive distributivity

A non-exhaustive distribution scenario is illustrated in Figure 2 below. In this scenario, the distribution of the objects (bananas) is not exhaustive because there is a participant (a woman) for whom the distribution of the '*two bananas*' has not occurred.

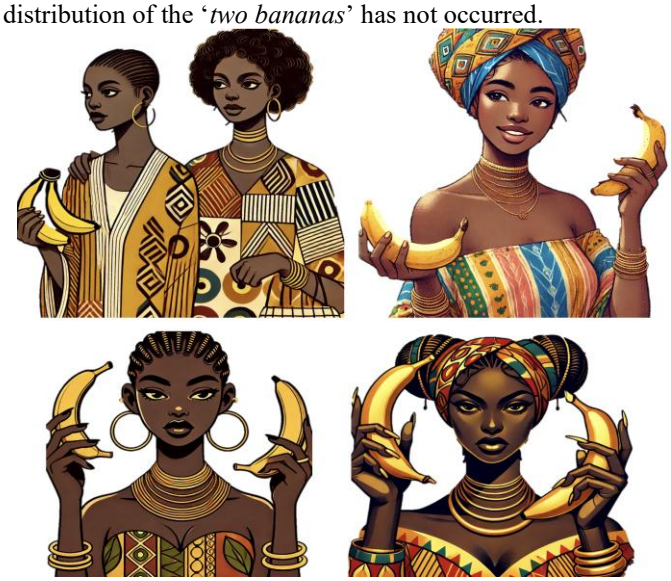

Figure 2: Non-exhaustive distribution scenario

We elicited judgments from our informants on the scenario to determine whether it corresponds to sentences (14) and/or (15). The sentence in (15), containing a distributive quantifier, was consistently judged unacceptable, whereas the sentence in (14) with a reduplicated numeral was uniformly accepted. These results suggest that the distributivity

triggered by a distributive quantifier is not identical to that induced by a reduplicated numeral.

3.3.2. Non-atomic distributivity

A non-atomic distribution scenario is illustrated in Figure 3 below. In this scenario, the object '*two bananas*' is not distributed to each atom (each woman), because there is a case where *two bananas* are held collectively by two women, rather than two bananas for each individual woman.

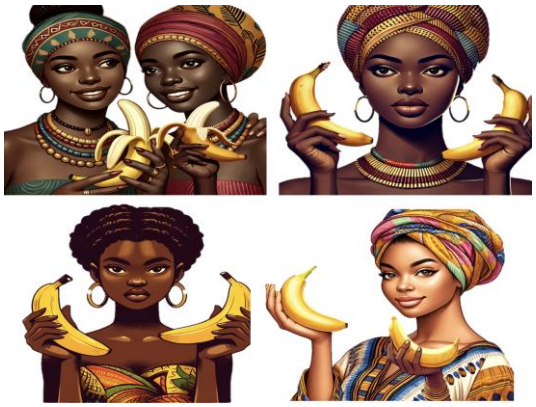

Figure 3: Non-atomic distribution scenario

Again, only the sentence (14) with a reduplicated numeral is accepted within this scenario. This shows that the focus is on the actions (event plurality), and these events each involve two distributed bananas, whether in an atomic or non-atomic manner. This leads us to conclude that numeral reduplication is better analyzed as a marker of pluractionality rather than of distributivity.

4. Conclusion

This study on the semantics of numeral reduplication in Haya aimed to determine whether it should be analyzed as a distributive quantifier or rather as a marker of pluractionality. It has been shown that the distributivity marked by reduplicated numerals differs from that of distributive quantifiers, in that reduplicated numerals allow non-atomic and non-exhaustive distributive readings, contrary to distributive quantifiers. Furthermore, numeral reduplication is considered a marker of pluractionality because: (i) it requires a plurality condition, meaning that the number of objects involved in the events is always greater than the reduplicated numeral; (ii) reduplicated numerals in sentences with a singular argument yield only temporal event-distributivity, excluding participant and spatial distributivities.

References

Balusu, R., 2006, 'Distributive reduplication in Telugu', In Christopher Davis, Amy Rose Deal, and Youri Zabbal (eds), *NELS 36: Proceedings of the thirty-sixth annual meeting of the North East Linguistic Society*, p. 39-52.

Bedar, A. & Allawama, A., 2024, 'Numerals reduplication as a pluractional marker in Jordanian Arabic', *Journal of Semitic Studies* 69.2, p. 947-964. https://doi.org/10.1093/jss/fgad045.
Bosnić, A., Demirdache, H. & Spenader, J., 2022, 'Exhaustivity and homogeneity effects with distributive-share markers: Experimental evidence from Serbian po', *Syntax* 25.1. p. 1-38. https://doi.org/10.1111/synt.12223.
Byarushengo, E. R., Duranti, A. & Hyman, M. L., 1977, *Haya grammatical structure: Phonology, grammar, discourse*, Published by the Department of Linguistics UNIVERSITY OF SOUTHERN CALIFORNIA
Cable, S., 2014, 'Distributive Numerals and Distance-distributivity in Tlingit (and beyond)', *Language,* 90.3, p. 562-606.
Cabredo-Hofherr, P. & Laca, B. (eds), 2012, *Verbal plurality and distributivity*. Berlin, Germany: Walter de Gruyter.
Choe, J-W., 1987, *Anti-quantifiers and a theory of distributivity*. Unpublished doctoral dissertation. University of Massachusetts, Amherst.
Corr, A., 2022, Numeral reduplication and clausal syntax: grammaticalized distributivity in Medieval Iberia'. *Probus* 34.2, p. 317-365.
Donazzan, M. & Müller, A.L., 2015, 'Reduplicated numerals as pluractionals: Distributivity as a window to the individuation of events'. *Journal of Portuguese Linguistics* 14, p. 95-129.
Dressler, W.U., 1968). *Studien zur verbalen Pluralität: Iterativum, Distributivum, Durativum, Intensivum in der allgemeinen Grammatik, im Lateinischen und Hethitischen*. Sitzungsberichte.
Farkas, D.F., 1997, Dependent indefinites'. In Corblin, F., Godard, D. & Marandin, J.-M., (eds), *Empirical Issues in Syntax and Semantics* 1, p. 243–268. Peter Lang.
Gil, D., 1982, *Distributive numerals*. Unpublished doctoral dissertation. University of California, Los Angeles.
Gil, D., 1988, 'Georgian reduplication and the domain of distributivity'. *Linguistics* 26.6, p. 1039-1066.
Henderson, R., 2014, Dependent indefinites and their post-suppositions', *Semantics and Pragmatics*, 7.6, p. 1-58.
Knežević, N., 2015, *Numerals and distributivity in Serbian: at the syntax-semantics-acquisition interface*. Unpublished doctoral dissertation. Université de Nantes.
Knežević, N. & Demirdache, H., 2018, 'Universal Quantification and Distributive Marking in Serbian', In É. Kiss, K., Zétényi, T. (eds) *Linguistic and Cognitive Aspects of Quantification*, Studies in Theoretical Psycholinguistics, 47, p. 115-140. https://doi.org/10.1007/978-3-319-91566-1_6.
Knežević, N. & Bedar, A., 2024, 'Numeral reduplication in Taqbaylit', In Korangy, Aleriza & Bensoukas, Karim (eds). *The Springer Handbook of Berber Linguistics*. Springer, p. 571-595. Springer. https://doi.org/10.1007/978-981-99-5690-6_26.
Kuhn, J., 2019, 'Pluractionality and distributive numerals', *Language and Linguist Compass* 13.2, e12309. https://doi.org/10.1111/lnc3.12309.
Matthewson, L., 2000, 'On Distributivity and Pluractionality', *Semantics and Linguistic Theory* 10, p. 98-114.

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