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Numeral reduplication in Taqbaylit

Nataša KNEŽEVIĆ & Amazigh BEDAR

Abstract

This paper investigates the numeral reduplication (*NumRed*) in Taqbaylit, involving distributive interpretations. We argue that *NumRed* in Taqbaylit is not a universal distributive quantifier over individuals but a marker of event plurality. Furthermore, we show that various distributive readings are not due to the ambiguity but rather to the vague semantics of the distributive morpheme *Red(uplication)*. Our main claim is that (i) *Red* is an event plurality marker, (ii) distributive readings of *NumRed* arise through spatiotemporal separation of (sub)events and (iii) participant-distributive readings should be reduced to spatial-distributive readings. The aim of our investigation of *NumRed* in Taqbaylit has been to contribute to the novel insights into distributive numerals and pluractionals across languages, as well to open the door to more investigation of reduplication, distributivity and pluractionality in the Berber languages.

1. Introduction

This paper investigates numeral reduplication (*NumRed*) in Taqbaylit[1]. An example with a reduplicated numeral *snaθ* 'two' is given in (1)[2].

(1)	rəfð-ənt	θəqʃiʃin =ənni	**snaθ**	**snaθ**	**n**	**təbwaḍin**
	carry.PFV-3F.PL	CS.girl.PL =Dem	**two.F**	**two.F**	**Gen**	**CS.box.F.PL**

Lit. The girls carried **two two boxes**.

i. Participant-distributive 'The girls carried two boxes **each**.'

ii. Event-distributive 'The girls carried two boxes **at different times/places.**'

[1] Taqbaylit, also called 'kabyle', is a VSO language of the Berber language family (Afroasiatic phylum). The examples given in this paper were provided by one of the authors of this paper, Amazigh Bedar, a native speaker of Taqbaylit of Chemini. The examples are transcribed with the International Phonetic Alphabet (IPA).

[2] Abbreviations: "-"= affix boundary, "="= clitic boundary, 1, 2 & 3 = person, acc = accusative clitic (Direct object clitic), CAUS = causative, comp = complementizer, CS = construct state (Nominative case), Dem = demonstrative, Dir = Directional particle, F = feminine, FS= free state (Accusative case), Gen = genitive, IPFV = imperfective, Lit. = Literal translation, M = masculine, PFV = perfective, PL = plural, SG = singular.

Reduplication is in general associated with distributivity across languages (Gil 1982, 1988, Balusu 2006, Bouzidi 2012, Cabredo Hofherr and Laca 2012, É. Kiss et al. 2013, among others). Reduplicated numerals with distributive interpretations are also called *distributive numerals* (Gil 1982, 1988). The term *distance distributivity* (Zimmermann 2002) is used in the literature to encompass many somewhat different but closely related phenomena, namely - distributive numerals (Gil 1982, Cable 2014, Knežević 2015), 'anti-quantifiers' (Choe 1987, Zimmermann 2002), distributive-share markers (Gil 1995) and pluractional markers (Matthewson 2000)[3].

The main difference between distributive numerals and distributive (universal) quantifiers (*mkul* in Taqbaylit or *every* and *each* in English) is that, while the later combine with the NP serving as a distributive-key (the NP over which the distribution takes place) yielding so-called participant-distributive readings, the former appear to combine with the NP serving as a distributive-share (entity that is being distributed), yielding both participant-distributive and event-distributive readings, as illustrated in (1). The major issue in the literature of distance distributivity has been how to account for this apparent ambiguity. On some approaches, distributive numerals are analysed as involving the distributive operator *each,* selecting for the distributive-key either participants or a covert spatiotemporal argument (Choe 1987, Oh 2001, Zimmermann 2002, Champollion 2012). Therefore, the sentences with distributive numerals are ambiguous between participant-distributive (distribution over individuals), as illustrated with (1.i), and event-distributive readings (distribution over times/spaces), as illustrated with (1.ii).

We argue that distributive numerals - *NumRed* in Taqbaylit cannot be analysed as involving the distributive *each*, by showing that the distributive numerals do not involve universal quantification over individuals but event plurality. Furthermore, we argue that sentences with distributive-numerals - *NumRed*, are not ambiguous but always involve distribution over times and/or spaces. Our main claim is that (i) *Red(*uplication) is an event plurality marker, (ii) distributive readings of *NumRed* arise through spatiotemporal separation of (sub)events and (iii) participant-distributive readings should be reduced to spatial-distributive readings.

Although we do not contend that the distributive dependency in terms of Choe (1987) can be applied to *NumRed* in Taqbaylit, we use the terms distributive-key and distributive-share throughout the paper to descriptively refer to the NP combining with the *NumRed* as the distributive-share, and the argument that seems to be distributed over as the distributive-key (be it participant or spatiotemporal argument). We also use the term *participant-distributive reading* to describe a plural event where in each (sub)event there is an atomic participant that seems to be distributed over by the distributive -share, although we assume that participant-distribution is the subcase of the spatiotemporal distribution.

The paper is organized as follows. We start by exposing the issue of numerals and distributivity in section 2. In section 3 we review the properties of *NumRed* in Taqbaylit by comparing them to the universal quantifiers *mkul/each*, and to pluractional markers. We show that *NumRed* always involves plurality of events that must be temporally or spatially separated. In some

[3] In this paper, we will use the term *distributive numerals*.

cases, only temporal distribution is allowed. In section 4, we sketch an explicit analysis of *Red* as a pluractional marker and illustrate how it applies to our examples of sentences with *NumRed*. We conclude in section 5.

2. Numerals and distributivity

The sentences with numerals are generally ambiguous between a collective and a distributive reading[4]. This is illustrated in the example in Taqbaylit below[5].

(2)	rəfð-ənt	θəqʃiʃin =ənni	**snaθ**	**n**	**təbwaḍin**
	carry.PFV-3F.PL	CS.girl.PL =Dem	two.F	Gen	CS.box.F.PL

'The girls carried **two boxes**.'

i. *Collective* The girls carried two boxes **together**.

ii. *Participant-distributive* The girls carried two boxes **each**.

On the collective reading of (2), the girls carried two boxes together, at the same place and at the same time.
On the distributive reading of (2), each girl carried two different boxes. Note that, contrary to the distributive numerals *(NumRed*) in (1), numerals in (2) do not yield event-distributive readings, but only so-called participant-distributive reading.
Following Choe (1987) and subsequent approaches, distributivity is referred to as a relation between two arguments - a distributive-key (or sorting-key) and a distributive-share.
The distributive-key, which must be semantically plural, denotes the participant over which the distribution takes place, here, *θəqʃiʃin =ənni* 'the girls'. The distributive-share, which must be a non-specific expression of an explicit quantity, denotes the participant (the entity) which is being distributed, here *snaθ n təbwaḍin* 'two boxes'. According to this, on the distributive reading of (2), each girl carried two boxes, since 'two boxes' are distributed over the members of the group of girls. Importantly, under the distributive reading of (2), the number of boxes depends on the number of girls, since 'two boxes' is multiplied by the total number of the girls participating in the event. If, for instance, there are three girls involved in the described event, the total of boxes will be six (two boxes distributed to each of the three girls).

[4] Not only numerals are ambiguous between the collective and the distributive interpretations. This is also true of the plural NPs, for instance. In this paper, we focus on the distributivity of numerals.
[5] The genitive preposition *n* obligatorily intervenes between a numeral and an NP.

In many languages there are ways of disambiguating sentences with numerals by using an overt distributive marker. This can be achieved, for example, by using the universal (adnominal) distributive quantifier *mkul* in Taqbaylit, illustrated in (3a), as well as the universal quantifiers *every* and *each*[6] in English, the later being illustrated in (3b).

(3) a.

mkul	**θaqʃiʃθ**	θə-rfəð	snaθ	n	təbwaḍin
each	FS.girl	3F.SG-carry.PFV	two.F	Gen	CS.box.F.PL

b. **Each girl** carried two boxes.

Using the terminology from Choe (1987), *mkul* and *each* select as their arguments the NP 'girl' serving as a distributive-key (over which the distribution takes place). The NP 'two boxes' serves as a distributive-share, so 'two boxes' are distributed over the atomic members of the group of girls. Importantly, the number of boxes in the event depends on the number of girls to which 'two boxes' are distributed (there are two boxes per girl in the event).

Languages vary according to whether they have a morphological marker for the distributive-key (English), for the the distributive-share (Georgian), or whether they have both distributive-key and distributive-share markers (Serbian) (cf. Gil 1988, Choe 1987, Knežević 2015). As we have seen above, typically, adnominal quantifiers, such as Taqbaylit *mkul* and English *each* are taken to mark the distributive-key. That is, they take as an argument the NP serving as the distributive-key (the argument over which the distribution takes place). By contrast, distributive markers, such as morphemes *-ssik* in Korean (Choe 1987, Oh 2001), *-gaa* in Tlingit (Cable 2014), *po* in Serbian (Knežević 2015), or reduplicated numerals in Taqbaylit, combine with the NP serving as the distributive-share (the argument that is distributed over the distributive-key). This is illustrated in the Taqbaylit sentence with *NumRed* in (1), repeated in (4).

(4)

rəfð-ənt	θəqʃiʃin =ənni	**snaθ**	**snaθ**	**n**	**təbwaḍin**
carry.PFV-3F.PL	CS.girl.PL =Dem	two.F	two.F	Gen	CS.box.F.PL

Lit. The girls carried **two two boxes.**

i. Participant-distributive 'The girls carried two boxes **each**.'

ii. Event-distributive 'The girls carried two boxes **at different times/places**.'

[6] See Beghelli & Stowell (1997) for the discussion on differences between *every* and *each*. In Taqbaylit, there is only one lexical item for the (singular) universal quantifier - *mkul*. In this paper, we will systematically use *each* in English in parallel to *mkul* in Taqbaylit.

First note that, unlike the sentence in (2), the sentence in (4) does not yield the collective reading under which the girls carried two boxes together at the same time or/and place.

The sentence in (4) yields only distributive readings. Like the sentence with the universal quantifier *mkul/each* in (3), (4) gives rise to the so-called participant-distributive reading under which each of the girls carried two boxes. That is, 'two boxes' are distributed over the atomic agent participants in the described event. Importantly, the sentence in (4), unlike the sentence in (3), also yields the event-distributive reading, under which the girls carried two boxes at different times and/or places. In the terms of Choe (1987), we can describe the event-distributive reading as distribution over a covert spatiotemporal argument. The distributive-share here is the event of carrying two boxes, which is distributed over the distributive-key - time intervals or/and locations. Note that there are two correlated differences between the distributive-key (universal) quantifiers, such as *mkul/each* in (3) and the distributive-share markers, such as *NumRed* in (4). The former syntactically combine with the NP serving as the distributive-key and yield only participant-distributive readings, while the latter syntactically combine with the NP serving as a distributive-share and yield two types of distributive readings, participant-distributive and event-distributive.

In the literature, the major question concerning the distributive-numerals (marking the distributive-share) is whether they are ambiguous between the participant-distributive and the event-distributive readings and how to account for this ambiguity. On the first type of accounts (Choe 1987, Zimmermann 2002), the distributive-share markers (distributive numerals), just as the distributive-key markers (distributive universal quantifiers), involve a D-operator (universal quantifier *each*) that takes as its restriction either the participant (NP it combines with), yielding the participant-distributive reading, or a covert spatiotemporal arguments-times/places, yielding the event-distributive readings. On the second type of accounts (Cable 2014, Knežević 2015), distributive numerals (distributive-share markers) are not ambiguous and always involve event plurality[7]. The distributive interpretations arise through the spatiotemporal separation of the (sub)events, and the participant-distributive reading can be derived as an instance of the spatiotemporal distribution.

Following Cable (2014) and Knežević (2015), we argue that the *NumRed* in Taqbaylit is a marker of event plurality. In the next section we examine the syntactic distribution and the semantic properties of *NumRed* by comparing them to universal quantifiers and pluractionals.

[7] Balusu (2006) provides an analysis of numeral reduplication in Telugu also avoiding the ambiguity by assuming that the participant-distribution can be derived as the instance of the spatiotemporal distribution. Contrary to other operator-based approaches assuming that the distributive-key is either a plural participant or a spatiotemporal argument, Balusu argues that the distributive-key is always a spatiotemporal argument. However, Balusu's analysis also makes use of the distributive operator *each*, which is not the case with Cable's (2014) and Knežević's (2015) approaches.

3. Numeral reduplication and pluractionality

Pluractional markers across languages often involve reduplication of different lexical categories (most typically, the verb) and/or affixes on the verbs (Newman 1980, 1990, Cusic 1981, Lasersohn 1995, Landman 2000, among others). They indicate the basic meaning of multiplicity of events (actions) or repeated actions, involving thus multiple event times, spaces or/and participants. One of the most prominent characteristics of pluractionals is that of distributivity, i.e. 'action by more than one individual, temporally iterated action, and spatially scattered action' (Lasersohn 1995:238). This basic meaning invoking a plurality of events gives rise furthermore to the effect of the following associated meanings, listed in Cusic (1981:74): repetitiveness, repeated occasions or events, habitual agency, distributed quality, inchoativity, distribution, cumulative result, intensity, augmentation, diminution, plurality of sites of action, duration, persistent consequences, celerativity, continuity. Pluractional markers are classified according to three main criteria: (sub)events must have separate running times, running spaces or thematic roles (Lasersohn 1995). Which is chosen depends on the lexical meaning of a particular pluractional morpheme or of the lexical category of the reduplicated item. We consider that *Red* in *NumRed* NPs in Taqbaylit is a unique pluractional morpheme responsible for all distributive readings - spatial (including participant) and temporal.

We first overview, in 3.1., the syntactic distribution of *NumRed* and the kinds of participant-distributive readings depending on it. We point out that *NumRed* always yields temporal-distributive readings, unlike universal quantifiers and like pluractionals; that in some cases it also allows spatial-distributive readings, again unlike universal quantifiers and like (some) pluractionals. Furthermore, we show in 3.2. that the so-called participant-distributive reading is reducible to the spatial-distributive reading. Then we discuss the properties of atomicity (Knežević 2015, Knežević & Demirdache 2018) and exhaustivity (Matthewson 2000, Knežević 2015, Knežević & Demirdache 2018) in 3.3., as well as the plurality requirement (Lasersohn 1995, Balusu 2006, Knežević 2015) in 3.4. We show that first, unlike the distributive universal quantifiers *mkul/each*, *NumRed* does not require atomic and exhaustive distribution over individuals; second, like pluractionals, *NumRed* obeys to the plurality requirement (Balusu 2006), i.e. participants provided by *NumRed* NP must be different across the (sub)events.

3.1. Syntactic distribution of *NumRed*

Numeral reduplication[8] (*NumRed*) in Taqbaylit appears in transitive sentences with numerals in a subject position, in an object position or in both a subject and an object position simultaneously.

[8] The reduplication is a very productive morphosyntactic strategy in Taqbaylit. Nearly every lexical category reduplicates (Bouzidi 2012). We hypothesize that at least the verbal reduplication also involves event plurality. However, there are some important empirical differences between the numeral reduplication and the verbal reduplication that require an in-depth examination. We leave this issue aside for further research.

NumRed can also appear in transitive sentences with a morphologically singular argument (marking the singular subject or the singular object) and in intransitive sentences.
The kind of so-called participant-distributive interpretation of a sentence with *NumRed* depends on the syntactic position of the *NumRed.* Note that *NumRed* has a strict syntactic position, i.e. it cannot be split of the NP it combines with as it is the case with, for instance, the distributive universal quantifier *each* (floating *each*) in English (Beghelli & Stowell 1997). Recall that, descriptively, *NumRed* always marks the distributive-share (the entity that is being distributed).

Transitive sentences with two numerals[9]

In the examples below, we illustrate *NumRed* in an object position in (5), in a subject position in (7), and in both a subject and an object position simultaneously in (9), and the types of readings available with them in (6), (8) and (10) respectively.

NumRed in an object position

(5)	θlaθa	n	təqʃiʃin	rəfð-ənt
	three	Gen	CS.girl.PL	carry.PFV-3F.PL
	snaθ	**snaθ**	**n**	**təbwaḍin**
	two.F	two.F	Gen	CS.box.F.PL

Lit. Three girls carried **two two boxes**.

‘**Three girls** carried two boxes **each**.’
‘Three girls carried two boxes **at different times/places.**’

(6) a. Participant-distributive scenario:
Yesterday, Dihya, Anya and Kenza each carried two boxes at the same time.

b. Event-distributive scenarios:
Every Monday this month, Dihya, Anya and Kenza carried two boxes. They either each carried two different boxes; or they carried two different boxes together; or Dihya and Anya carried two boxes while Kenza carried two different boxes.

[9] The *NumRed* in transitive sentences with one numeral and one plural NP, as illustrated in the sentence in (1), has the same semantic effect as in the sentences with two numerals (one simple and one reduplicated numeral), given in (5). We choose to present the second because it is easier to clarify the dependence between the syntactic position of the *NumRed* and the type of the participant-distributive interpretation of a sentence.

The sentence in (5) yields so-called participant-distributive reading, i.e. it is true under the scenario in (6a), where each of the three girls carried two (different) boxes. That is, we can descriptively say that 'two boxes' (distributive-share) are distributed over the set of girls (distributive-key). So, when *NumRed* marks the object (*snaθ snaθ n təbwaḍin* 'two two boxes'), the distribution is done over the subject (*θlaθa n təqʃiʃin* 'three girls.').

The sentence also yields the event-distributive readings, under which three girls carried two boxes at different times and/or places. Importantly, the sentence is true in the scenario described in (6b), under which there are multiple events of carrying two boxes but the three girls could participate in those (sub)events individually, together or in groups (the non-atomic group of two girls carried two boxes, while the atomic member, one girl, carried two different boxes). This suggests that *NumRed* does not require atomic participants in the (sub)events as it is the case with the universal quantifier *mkul* in Taqbaylit and *each* in English. This also means that, contrary to the sentences with a (simple) numeral in (2) and the universal quantifier *mkul* in (3), in the sentence with *NumRed* in (5), *the number of boxes does not depend on the number of girls* in the event, since the distribution is not (necessary) over the atomic girls.

Rather, *NumRed* requires at least two (sub)events of carrying two boxes, that are temporally and/or spatially separated. This means that there will be four boxes or more, always multiples of two (six, eight etc.) in the event.

NumRed in a subject position[10]

(7) **θlaθa** **θlaθa** **n** **təqʃiʃin** rəfð-ənt snaθ n

three three Gen CS.girl.PL carry.PFV-3F.PL two.F Gen

təbwaḍin

FS.box.F.PL

Lit. **Three three girls** carried two boxes.

'Three girls carried **each of the two boxes.**'
'Three girls carried two boxes **at different times/places.**'

(8) a. Participant-distributive scenario:
Last Monday, Dihya, Anya and Kenza carried one box, while Lwiza, Damya and Tanina carried another box at the same time.

[10] The canonical word order in Taqbaylit is VSO. When *NumRed* is in a subject position, the obligatory word order becomes SVO.

b. Event-distributive scenarios:

Every Monday last month, (at least) three (different) girls carried two boxes. Either three girls carried the two boxes together; or three girls carried one box while three different girls carried another box; or three girls carried two boxes, while three different girls carried another set of two boxes.

The sentence in (7), with *Red* combining with the subject NP 'three girls' is true under the participant-distributive scenario in (8a), where, descriptively, three (different) girls (distributive-share) are distributed over the members of the set of two boxes (distributive-key), so that each of the two boxes is carried by three girls. So, when *NumRed* marks the subject (*θlaθa θlaθa n təqʃiʃin* 'three three girls'), the distribution is done over the object (*snaθ n təbwaḍin* 'two boxes').
The sentence is also true under the event-distributive scenario in (8b), where at different times/places, the groups of three girls participated in the (sub)events of carrying cumulatively two boxes (two boxes per subevent or two boxes in total). Again, unlike the sentences with a (simple) numeral in (2) and the universal quantifier *mkul* in (3), in the sentence with *NumRed* in (7), *the number of girls does not depend on the number of boxes* in the event, since the distribution is not (necessary) over the atomic boxes. Parallel to (5), *NumRed* in (7) requires at least two (sub)events involving three girls carrying boxes, that are temporally and/or spatially separated. This means that there will be six girls or more, always multiples of three (nine, twelve etc.) in the event.

NumRed in a subject and in an object positions

(9)	**θlaθa**	**θlaθa**	**n**	**təqʃiʃin**	rəfð-ənt	**snaθ**	**snaθ**
	three	three	Gen	CS.girl.PL	carry.PFV-3F.PL	two.F	two.F
	n	**təbwaḍin**					
	Gen	FS.box.F.PL					

Lit. **Three three girls** carried **two two boxes**.

'Three girls carried two boxes **at different times/places.**'

(10) Event-distributive scenarios:

a. *Spatial:* Last Friday, Dihya, Anya and Kenza carried together two boxes, while Lwiza, Damya and Tanina carried together two different boxes at the same time.

b. *Temporal*: Every Monday last month, the girls in groups of three carried the boxes in groups of two.

In (9), *NumRed* appears in both the subject and the object positions. Descriptively again, both subject and object are marked by *NumRed* as distributive-shares, that is, need to be distributed. Since there is no other plural argument available for the distributive-key, the distribution is over a covert spatiotemporal argument - locations and/or time intervals. This is why (9) yields only event-distributive readings in (10) and not so-called participant-distributive reading. What is required is that there is a multiplicity of (sub)events each of which involving the girls in threes and the boxes in twos. These events can be happening at the same time but then must be spatially separated, as in (10a). Or these events can be only temporally separated, as illustrated in (10b). Parallel to (5) and (7), *NumRed in* (9) requires at least two (sub)events involving three girls and two boxes, that are temporally and/or spatially separated. This means that there will be six girls or more, always multiples of three (nine, twelve etc.), and four boxes or more, always multiples of two (six, eight etc.) in the event.

To resume, all transitive sentences, with *NumRed* in an object position in (5), with *NumRed* in a subject position in (7) and with *NumRed* in both a subject and an object positions in (9) yield event-distributive readings (spatial and temporal). Sentences (5) and (7) also yield so-called participant distributive readings, depending on the syntactic position of *NumRed*. These are the readings under which in each subevent there are atomic participants (girls in (5) and boxes in (7)). Importantly, both atomic and non-atomic separation of participants is possible. That is, 'three girls' in (5) can be separated in different subevents in groups of two and one, and not only atomically - one (atom) girl in each subevent (see scenarios in (6a) and (6b) for sentence (5)). This non-atomic participant distribution puts forward two correlated facts. First, unlike the universal distributive quantifiers *mkul/each, NumRed* does not distribute over (atomic) individuals. This is at the same time an argument against the distributive dependencies between the two arguments (in the sense of Choe 1987), which could be paraphrased as: for each girl, there are two boxes which she carried. The availability of the non-atomic readings rules out the analysis of *NumRed* in Taqbaylit as involving the distributive operator *each*.
Second, spatial separation of events is achieved via participant (atomic or non-atomic) separation.

3.2. Participant-distribution is reducible to spatial-distribution

In the previous section, we have seen that transitive sentences with two plural arguments yield participant and event-distributive readings. Importantly, both atomic and non-atomic separation of participants is possible, which suggests that spatial separation of events is achieved through participant separation.
In this section we present two more arguments in favour of our claim that participant-distributive readings should be reduced to spatial-distributive readings. To achieve this, we present the sentences which yield only event-distributive reading[11] - transitive sentences with one singular

[11] Many pluractional markers, especially those marking the verb, yield only temporal-distributive readings. For illustration, see, for instance, Cabredo Hofherr, Pasquereau & O'Meara (2019) analysing MULT verb stems (marking

argument and one *NumRed*, yielding only temporal event-distributive readings, and intransitive sentences with *NumRed*, yielding both spatial and temporal event-distributive readings.

Transitive sentences with one singular argument

Let us look at the sentences with one singular argument - subject or object NP, and one *NumRed* NP.

Singular subject

(11) θə-rfəð **Dihya** **snaθ** **snaθ** **n** **təbwaḍin**

3F.SG-carry.PFV Dihya two.F two.F Gen FS.box.F.PL

Lit. **Dihya** carried **two two boxes**.

'Dihya carried two boxes **at different places/separately.'**

'Dihya carried the boxes **two by two/two at a time.**'

(12) Event-distributive scenarios:

a. *Spatial*: Yesterday, Dihya carried two boxes in one hand and two different boxes in another hand.

b. *Temporal*: On Mondays last month, Dihya carried two boxes up to her apartment.

As illustrated in (11), *NumRed* appears also in transitive sentences with one singular argument, here the singular subject 'Dihya'. *Red* appears with the object NP *snaθ n təbwaḍin* 'two boxes'. The distribution of 'two boxes' cannot be over the singular argument 'Dihya' and therefore must be over a covert spatiotemporal argument. Naturally, participant-distributive reading is not available.

The sentence (11) is felicitous under the temporal event-distributive scenario in (12b). The (sub)events each involving two (different boxes) have the same participant (Dihya), the same place (Dihya's apartment), but have different running times (on Mondays).

Importantly, the sentence in (11) is *infelicitous under the spatial event-distributive scenario* in (12a), under which the (sub)events each involving two boxes have the same running time (are simultaneous), have the same participant (Dihya), but are spatially separated - in each hand, Dihya carried two boxes. This unavailability of spatial separation of events, even forced by the context

the multiplicity of events) in Seri, or Matthewson (2000) analysing *pelpala7,* the reduplicated numeral 'one' in Lillooet Salish.

in (12a) suggests that the spatial separation can only be achieved via participant separation. When participant separation is not possible, since the participant is singular (Dihya), neither participant or spatial distributive readings arise.

Singular object

(13)	**snaθ**	**snaθ**	**n**	**təqʃiʃin**	ss-arð-ənt	**θaxxamt= ənni**
	two.F	two.F	Gen	CS.girl.PL	CAUS-clean.PFV-3F.PL	**room=Dem**

Lit. **Two two girls** cleaned **the room**.

'**The girls in twos** cleaned the room (at the same time).'

'The girls cleaned the room **two by two/two at a time.**'

(14) Event-distributive scenarios:

a. *Spatial*: Yesterday, four girls cleaned the (ball)room. Dihya and Kenza cleaned together the east part of the room, while at the same time Anya and Tanina cleaned together the west part of the room.

b. *Temporal*: On Monday, Dihya and Kenza cleaned the room. On Tuesday, Anya and Tanina cleaned the same room.

In (13), the singular argument is the object NP *θaxxamt=ənni* 'the room', while the subject is marked with *NumRed, snaθ snaθ n təqʃiʃin* 'two two girls', and therefore appears as the distributive-share. Naturally, the distribution cannot be over the singular object, so the participant-distributive reading does not arise.

The sentence in (13), just like the sentence in (11), is felicitous under the temporal event-distributive scenario in (14b), under which the (sub)events each involving two different girls have the same running space (the room) which is also the shared participant (object) of the cleaning events, but have separate running times (Monday and Tueseday).

Again, like (11), (13) *is not felicitous under the spatial event-distributive scenario* in (14a), under which the (sub)events each involving two girls have the same participant 'the room', the same running time (are simultaneous), but have separate running spaces - west and east part of the room. Parallel to (11) and (12a), it is not possible to force the spatial separation of events in (13) by the context in (14a).

The examples with *NumRed* and a singular subject NP in (11) and a singular object NP in (13) show that sentences with a singular argument yield only temporal event-distributive readings. The participant-distributive reading is not available since it requires a plural participant which is split into atomic members for each subevent, over which we distribute. This is not the case in (11), since the subject is the singular DP 'Dihya' nor in (13) where the object is the singular DP 'the room'.

Let us turn to the unavailability of the spatial event-distributive reading. As illustrated in (12a) for (11), the only way to make the spatial separation of the subevents possible without the participant separation (since there is a sole participant, Dihya), i.e. to imagine Dihya participating in two events at the same time, each involving carrying two boxes, is imagining that Dihaya carries two boxes in each hand. Nevertheless, it is not possible to use the sentence in (11) *θə-rfəð Dihya snaθ snaθ n təbwaḍin* (*Dihya carried two two boxes)* to describe this scenario. The same is illustrated in (14a) for (13). The only way to make spatial separation of the (sub)events, each involving two different girls and the same participant ('the room') at the same time is to 'distribute' 'two girls' at different parts of the room. This scenario cannot however be described using the sentence in (13) *snaθ snaθ n təqʃiʃin ss-arð-ənt θaxxamt=ənni* (*Two two girls cleaned the room)*.

The question arises why spatial distribution is possible with (5) and (7) involving a plural subject and a plural object arguments respectively, but not with (11) and (13) involving a singular subject and a singular object arguments respectively, even when the spatial separation is made salient by the context. One possible explanation is that the only salient criterion for the spatial separation of (sub)events is via participant separation. If this is the case, then spatial distribution and participant distribution should be reduced to a single type of distribution.

In favor of this argument, recall that, under the participant-distributive readings, the (sub)events **must** take place at different locations, since the atomic (but also non-atomic) participants cannot occupy the very same locations simultaneously. This is exactly the reason why sentences with a singular participant, like (11) and (13) do not yield the participant-distributive readings either.

Intransitive sentences

The following example illustrates *NumRed* in an intransitive sentence.

(15)	θə-ppḍ =əd	**jiwəθ**	**jiwəθ**	**n**	**təqʃiʃθ**
	3F.SG-arrive.PFV = Dir	one.F	one.F	Gen	CS.girl

Lit. Arrived **one one girl**.

'**One girl**/the girls arrived **from different locations**.'

'The girls arrived **one by one/one at a time**.'

(16) Event-distributive scenarios:

a. *Spatial*: Dihya and Kenza left from your place together this morning. In the afternoon, Dihya arrived through your front door at the same time as Kenza, coming from a completely different place, for a different reason, separately, arrived through your back door. (adapted from Matthewson 2000: 108)

b. *Temporal*: Dihya arrived at 14h00 and Kenza arrived at 14h10.

The sentence in (15) is felicitous under the temporal event-distributive scenario where the (sub)events, involving one different girl, are temporally separated, i.e. the girls arriving one at a time, as in (16b).

The intransitive sentence with the *NumRed* subject in (15) naturally cannot yield the participant-distributive readings, since it has only one argument, marked for the distributive share by *Red*, *jiwəθ jiwəθ n təqʃiʃθ* 'one one girl'. There is no plural argument to be selected for the distributive-key, over which 'one girl' could be distributed.[12]

However, (15) is felicitous under the spatial event-distributive scenario in (16a) where the (sub)events involving one different girl are simultaneous (have the same running times) but are spatially separated - the girls arrived at the same time but from different places. The intransitive sentence in (15) therefore gives rise to both temporal and spatial event-distributive reading, contrary to the sentences with one singular argument, in (11) and (13), which only give rise to the temporal event-distributive reading.

We have advanced the idea that the spatial separation must be made salient by the context and that the participant separation is a relevant criterion for considering the spatial separation salient. Note that the spatial separation in (16a) is precisely the participant separation at the same time (different (atom) girls arriving from different places). Importantly, however, note that in (15), the only participants in the event, girls, are marked as the distributive-share by *NumRed (jiwəθ jiwəθ n təqʃiʃθ* 'one one girl'*)*. 'One girl' thus must be distributed over the covert spatiotemporal argument - spatial locations and time units.

Recall that in Choe (1987) and subsequent analyses, the distributivity is a relation between the distributive-key and the distributive-share. For illustration, in (5), the entity marked as the distributive-share (*snaθ snaθ n təbwaḍin* 'two two boxes') is distributed over the set denoted by the other plural argument, the distributive-key (*θlaθa n təqʃiʃin* 'three girls'). This is how the participant-distributive reading arises - 'two boxes' are distributed to the atomic members of the set of three girls. Although descriptively using Choe's terminology to talk about the NP marked with the *NumRed* as a distributive-share and the unmarked NP as a distributive-key, we have contended that *NumRed* does not involve distributive dependency between the two arguments. Still

[12] For comparison, see sentence (7) with *NumRed* in a subject position, under scenario (8a).

using Choe's terminology, we can say that the distributive-key NP serves as the criterion to separate the space units/locations over which the distributive-share is to be distributed. Importantly, in Choe's approach, the distributive-key NP must be partitioned into the atomic members (so that each of the three girls carried two boxes in (5)).

Contrary to this, our hypothesis is as follows. Spatial separation is always made via participant (atomic or non-atomic) separation.

In sentences where, descriptively, there is a suitable candidate for the distributive-key - plural argument not marked by *NumRed*, *θlaθa n təqʃiʃin* 'three girls' in (5), and *snaθ n təbwaḍin* 'two boxes' in (7), this argument *must* be used to separate the subevents spatially, by spatially dividing the plural participant into either atomic or, *importantly, non-atomic groups of participants.* This predicts the non-atomic spatial distributive reading of (5), illustrated in (6b), where the non-atomic groups of girls participated in each subevent of carrying two boxes. This also predicts the atomic spatial distributive reading of (5), illustrated in (6a), where the atomic groups of girls participated in each subevent of carrying two boxes. Note that this reading is precisely the tantamount of the so-called participant-distributive reading.

Turning to the sentences that yield only temporal event-distributive reading, as (11) and (13), with one singular argument and one *NumRed* NP. These are sentences without a suitable candidate for the distributive-key, since the only other argument non-marked as the distributive-share (by *NumRed*) is a singular DP *Dihya* in (11) and *θaxxamt= ənni* 'the room' in (13).

Since a singular participant cannot be at two different places at the same time, both participant and spatial-distributive readings are unavailable. The 'participant criterion' for permitting spatial separation seems to overrule the contexts in (12a) and (14a). This suggests that the presence of a singular NP seems to block the availability of a covert spatial argument to serve as a distributive-key. Therefore, the only allowed separation of subevents is temporal - the events involving Dihya carrying two boxes are separated/distributed over time intervals.

Finally, let us look at the sentences yielding both spatial and temporal event-distributive readings, like the intransitive sentence in (15). As in (11) and (13), in (15) there is no suitable NP for the distributive-key either, since the only argument is the subject marked by *NumRed* as distributive-share, *jiwəθ jiwəθ n təqʃiʃθ* 'one one girl'. The intransitivity of the sentence naturally thus excludes the participant-distributive reading. The very important difference, however, between (11) and (13) yielding only temporal event-distributive reading and (15), yielding both spatial and temporal event-distributive readings, is that the former are transitive sentences (with two arguments) and the last is an intransitive sentence (with only one argument). That is, in (15), the question of a suitable NP for distributive-key is irrelevant, since it is a sentence with one argument only. The only NP being distributive-share (*NumRed* NP *jiwəθ jiwəθ n təqʃiʃθ* 'one one girl'), and the absence

of a second NP, allow a covert spatial argument to be considered as a relevant and moreover, a suitable candidate for the distributive-key. That is, the subevents involving 'one girl arriving' can be either simultaneous (spatial separation) or non-simultaneous (temporal separation).

To resume, the availability of the participant-distributive readings depends on the presence/absence of a plural NP in a sentence which is not a distributive-share. If there is a singular NP in a sentence (not being the distributive-share), the integral argument must be considered as a potential distributive-key. Since it is not possible that the very same singular participant takes place in two events simultaneously but at different places, spatial event-distributive reading does not arise. If there is no another NP at all (other than the distributive-share), as it is the case with intransitive sentences, then the spatial separation of events is possible in the same way as temporal separation - the events involving *n(umeral)* NP (numeral given by *NumRed* NP) can be separated either spatially or temporally, i.e. distributed either over spatial locations or time units. The nonavailability of the spatial event-distributive reading with transitive sentences with one singular argument, as well as the non-atomic participant-distributive readings of transitive sentences with two plural arguments, are an evidence that the spatial and participant distribution should merge to one and the only kind of distribution. We argue that both cases should be considered as spatial distribution. The reason is the following: the participant-distributive scenario is the one in which in each (sub)event, there is an atomic participant. This is however not mandatory with *NumRed,* since, as we have seen in sentences (5) and (7), non-atomic partitioning of the group of participants is also acceptable (see (6b) and (8b)). We thus conclude that the spatial distribution is obtained via participant distribution in the following way: if there is an NP which is not marked by *NumRed* (not distributive-share), then this NP must be plural, and it may be partitioned into atomic or non-atomic groups (see the scenarios in (6b) and in (8b)). If no such participant is available, that is, if the NP is singular, the spatial (and participant) event-distributive readings are unavailable. Consequently, only the temporal event-distributive reading arises. If, on the other hand, there is no other NP except the *NumRed* NP (distributive-share), the events involving *n* NP can be spatially or temporally separated. Consequently, both spatial and temporal event-distributive readings arise.

3.3. Atomicity and exhaustivity

In the previous sections, we have discussed the non-atomic readings of sentences with *NumRed* in favour of reducing participant distribution to spatial distribution. The atomicity, as well as exhaustivity, is also taken as a diagnostic for the universal quantification (Knežević 2015, Knežević and Demirdache 2018).
Here we explicitly illustrate the non-atomicity and the non-exhaustivity of *NumRed* sentences. We compare both properties with the universal distributive quantifiers *mkul/each*.

In the examples of transitive sentences with one simple numeral and one *NumRed,* in (5) and (7), we have seen, under the event-distributive scenarios in (6b) and (8b), that *NumRed*, unlike distributive universal quantifiers *mkul/each*, does not force distribution to atoms. That is, *mkul/each* force the distribution over atomic participants of the group of individuals denoted by an NP serving as a distributive-key. In other words, in the events of girls carrying two boxes, there must be one (atomic) girl in each (sub)event (see sentence (3), repeated in (18)). This is not the case with the sentence with *NumRed* in (4) repeated in (17).

(17)	rəfð-ənt	θəqʃiʃin =ənni	**snaθ**	**snaθ**	**n**	**təbwaḍin**
	carry.PFV-3F.PL	CS.girl.PL =Dem	two.F	two.F	Gen	CS.box.F.PL

Lit. The girls carried **two two boxes.**

'The girls carried two boxes **each**.'

'The girls carried two boxes **at different times/places**.'

True under the scenario in (19)
True under the scenario in (20)

(18) a.	**mkul**	**taqʃiʃθ**	θə-rfəð	snaθ	n	təbwaḍin
	each	FS.girl	3.F.SG-carry.PFV	two.F	Gen	CS.box.F.PL

b. '**Each**[13] **girl** carried two boxes.'

Not true under the scenario in (19)
Not true under the scenario in (20)

(19) Event-distributive scenario (non-atomicity):

Dihya, Anya and Kenza need to help their neighbors to bring up some boxes. Dihya and Anya carried two boxes together while Kenza carried two boxes alone.

Unlike (18) with *mkul*, (17) with *NumRed* is felicitous under the scenario in (19), under which in the (sub)events of carrying two boxes, there is a non-atomic group of girls (Dihya and Anya) and an atomic group (Kenza). This suggests that *NumRed* does not involve distribution over individuals but over spatiotemporal units that may, but need not, involve atomic participants.

[13] It has been argued that one of the differences between *each* and *every* in English is the atomicity - while it is obligatory with *each*, it is only preferable with *every*. For the discussion, see Beghelli & Stowell (1997).

NumRed, unlike distributive universal quantifiers *mkul/each*, does not force exhaustive distribution either. That is, since *NumRed* does not distribute to participants but to spatiotemporal locations, it does not force exhaustivity of the group of (subject) participants. This is illustrated in the scenario in (20), under which not all the girls participated in the carrying event. This scenario can be described with the *NumRed* sentence in (17) but not with the *mkul/each* sentence in (18) .

(20) Event-distributive scenario (non-exhaustivity):

> The girls, Dihya, Anya, Kenza and Tanina, must bring up some boxes. They carried two boxes each. Oh, of course, Tanina did not do anything but complaining that she was too tired to carry.

The so-called non-atomicity and non-exhaustivity of distribution with *NumRed* is precisely the evidence that *NumRed* does not involve the universal quantification over individuals. The 'non-atomic' and 'non-exhaustive' event-distributive readings provide evidence that *NumRed* involves a plurality of events temporally or spatially separated, with atomic or non-atomic participants in each subevent, and each involving the exact number of the entity provided by the *n*umeral in *Num* NP.

3.4. Plurality requirement

The issue of plurality requirement, addressed in the literature on distributive numerals (Balusu 2006, Knežević 2015, among others), is whether and to what extent participants provided by *NumRed* NP must be different or the same across the events. That is, can the total of individuals denoted by NPs be exactly *n(umeral)* in the group of events (separated spatially or temporally) or the total of individuals denoted by NP in the group of events needs to be greater than *n*? In other words, does, for instance, *θata θlata n təqʃiʃin* (*three three girls*) imply that the girls involved in the events must be three different girls per event, or three girls can always be the same, e.g. Dihya, Anya and Kenza. Our Taqbaylit consultants only accept the contexts where in each subevent there are three different girls that participate. This means that the number of the participants in the (whole) event is always greater than the number provided by the numeral in *NumRed* NP. Recall that distributive-shares must be indefinite (nonspecific) expressions of explicit quantity (Choe 1987). In Taqbaylit, it is not possible to use the (definite) determiner *ənni* in a sentence with *NumRed,* as illustrated with the ungrammatical sentence in (21). By opposition, it is possible to use *ənni* in a sentence with a simple *Num*, illustrated in (22). This suggests that *Red* ensures the non-specific interpretation of the NP it combines with, which also permits the pluralization of the participants denoted by the NP.

(21)	***θlaθa**	**θlaθa**	n	təqʃiʃin **=ənni**	rəfð-ənt
	three	**three**	Gen	CS.girl.PL **=Dem**	carry.PFV-3F.PL
	snatθ		n	təbwaḍin	
	two.F		Gen	FS.box.F.PL	

Lit. ***The three three** girls carried two boxes.

(22)	**θlaθa**	n	təqʃiʃin **=ənni**	rəfð-ənt	**snaθ**	n	təbwaḍin
	three	Gen	CS.girl.PL **=Dem**	carry.PFV-3F.PL	two.F	Gen	FS.box.F.PL

Lit. **The three girls** carried two boxes.

These examples suggest that different events (differentiated by *NumRed* in terms of different times/locations) also require different participants that are distributed. This descriptive fact supports the claim that *NumRed* is an event plurality marker, pluralizing not only the verb but also its participants (denoted by the NP with which the *NumRed* combines). Note that, importantly, in sentences with *NumRed*, say (5), the total number of participants given by *NumRed* NP (*snaθ snaθ n təbwaḍin* 'two two boxes', will not depend on the number of the members of the other plural NP (*θlaθa n təqʃiʃin* 'three girls'), as is the case with sentences with distributive *mkul/each,* in (3).

In this section, we have shown that *NumRed*, involving distributivity, importantly differs from the distributive universal quantifiers, such as *mkul/each* and shares some core properties with pluractional markers.

First, all sentences with *NumRed,* unlike distributive universal quantifiers, yield temporal event-distributive readings, where the distribution is over time intervals. Some also yield spatial event-distributive readings - transitive sentences with two plural arguments and intransitive sentences. Participant distribution is a subcase of the spatial distribution.

Second, participants in the described events do not have to be atomically partitioned (they can also be partitioned into groups or not partitioned at all), as is the case with distributive universal quantifiers. This holds for all sentences with *NumRed* that have plural participants not combining with the *NumRed.*

Third, the set of entities (be it participants, locations or times) over which the entity denoted by *NumRed* NP is distributed, need not be exhausted. This holds even in the case where the distribution is over atomic participants, which is not the case with the distributive universal quantifiers.

Finally, the entity denoted by the *Num* NP combining with *Red* must be pluralized across the (sub)events, as is the case in general with pluractional markers, pluralizing verbs and their participants. This means that the total number of participants denoted by *n* in *Num* NP is always greater than *n*.

4. Analysis

In this section, we sketch an explicit proposal as to how the meaning of *Red* contributes to the meaning of sentences with numerals. In a nutshell, the claim is that sentences with *NumRed* NPs describe events where the number of participating individuals described by NP is not exactly *n*, but greater. The events described by the sentence must be *constructed out of* (sub)events involving exactly *n* such individuals, but they must not be events of that kind themselves. We claim that (i) *Red* semantically combines with the numeral (*n*) and then with the NP and (ii) there must be at least two events that involve an NP of the quantity *n*.

4.1. Theoretical background

Theoretical accounts of the phenomena of distributive numerals or, more generally, distance distributivity (cf. Zimmermann 2002), can be understood as divided up into two theoretical camps. The first approach is based on the theories of universal quantification over individuals and takes as an underlying assumption that distance-distributive quantifiers (distributive numerals) involve a covert distributive operator *each* (Choe 1987, Oh 2001, Zimmermann 2002). The second approach is based on the theories of event quantification or, more accurately, event plurality. The event-based approach splits into two directions: one, which still makes use of the universal quantifier whose restriction is always an event argument (Balusu 2006); and the other, which takes that the semantics of the distributive element yields event plurality (Cable 2014, Knežević 2015). The main shortcoming of the operator-based proposals is that they do not predict 'intermediate' distributive readings of distributive numerals – those under which the atomic partition of a set is not required, and where the participants need not be exhaustively distributed over. Also, these analyses predict the exhaustivity and atomicity of a spatiotemporal argument. This is very difficult to test, since it is not clear either theoretically or empirically what the exhaustive and atomic distribution over time units and spatial locations would mean.

The event-based analyses seem to avoid these problems. The main originality of Cable's (2014) proposal, and the subsequent proposal in Knežević (2015), as opposed to previous analyses, is that they account for distributive readings in terms of sums of events which all involve an explicit number of participants (provided by a numeral). This avoids the problems encountered earlier, namely, the non-exhaustive distribution (over individuals), as well as the non-atomic participant-based distribution. That is – neither the number of participants in the event, nor their grouping into non-atomic or atomic groups, has an impact on the interpretation of a sentence. The semantics given to distributive numerals is large enough to cover all cases of event-distributive readings,

including the so-called participant-distributive reading. Although they deal with the distributive numerals in Tlingit and Serbian respectively, both authors additionally point out that the analyses can be extended to pluractionals (in a more general way) in Kaqchikel and Serbian. This is in line with the hypothesis, defended in this paper, that *NumRed* (distributive numerals) in Taqbaylit are pluractional markers.

4.2. Semantics of *Red*

Following Knežević's (2015) proposal for the distributive marker *po* in Serbian, we argue that *Red* in Taqbaylit is a marker of event plurality enforcing rather weak truth conditions – that is, merely that the situation described by the sentence containing a *NumRed* NP involves at least two events that are spatially or temporally separated, each of which must involve *n*NP(s) (where *n* stands for the numeral to which *Red* applies). The resulting sentence will be true under various scenarios, as long as the described events involving *n*NP(s) have different running times and/or running spaces. Essentially, *Red* contributes to the meaning of a sentence by conveying that there is a plurality of events, each involving *n*NP(s). We claim that (i) *Red* semantically combines first with a numeral (*n*) and then with an NP and (ii) there must be at least two events that involve an NP of the quantity *n*. The semantics of *Red* is given in (23).

(23) $[[Red]] = \lambda n.\ \lambda Q_{<e,t>}.\ \lambda P_{<e,\ t>}.\ \lambda e.\ e \in {}^*\varepsilon_{nQ} \ \&\ e \notin \varepsilon_{nQ} \ \&\ \exists x\ Q(x) = 1 \ \&\ P(x)(e) = 1$

To obtain the semantics below for *NumRed* NP, *Red* combines successively with the numeral (*n*) and the NP, in (24).

(24) $[[Red\ n\ NP]] = \lambda P_{<e,\ t>}.\ \lambda e.\ e \in {}^*\varepsilon_{n\mathrm{NP}} \ \&\ e \notin \varepsilon_{n\mathrm{NP}} \ \&\ \exists x\ [[NP]](x) = 1 \ \&\ P(x)(e) = 1$

For illustration, let us see below how the analysis applies to the transitive sentences with one *NumRed* (in an object or in a subject position) and with double *NumRed* (in both a subject and an object positions simultaneously).

The sentence with *NumRed* in an object position in (25a), will be assigned the semantics in (25b) where ε stands for a type of event involving *n*NP(s) (here, *two boxes*) and * for a cumulative denotation of the predicate (Link 1983).

(25) a. θlaθa n təqʃiʃin =ənni rəfð-ənt **snaθ** **snaθ**

three Gen CS.girl.PL =dem carry.PFV-3F.PL two.F two.F

n **təbwaḍin**

Gen CS.box.F.PL

Lit. Three girls carried **two two boxes**.

b. λe. e ∈ *Ɛ$_{2boxes}$ & e ∉ Ɛ$_{2boxes}$ & *****carry*(e)
& ∃ **x** *****box*(x) & Theme-sum(e)(x)
& ∃ **y** *****girl*(y) & | At(y) | = 3 & Agent-sum(e)(y)

c. There is an event constructed out of (sub)events each involving two boxes, and this is an event of three girls cumulatively carrying two boxes.

We can informally read (25b) as in (25c). On this proposal, the sentence in (25a) describes an event constructed out of (at least) two (sub)events involving three girls cumulatively (that is, together, in groups or individually) carrying two boxes. Since here *Red* appears with the numeral 'two' (the distributive-share), *Red* requires that each subevent involve exactly two boxes. Note in particular that the events described by (25a) are in *Ɛ$_{2boxes}$ -- they are sums of events in Ɛ$_{2boxes}$ -- but they are not in Ɛ$_{2boxes}$ themselves. They are thus constructed out of events in which exactly two boxes participate, but are not themselves like that. In other words, they must involve more than two boxes.

Let us suppose that the set of three girls is itself partitioned atomically and each girl atom individually carried two different boxes. Then the so-called participant-distributive reading arises since the ensuing reading is on a par with distributing two boxes over individuals (girl) atoms.

Supposing that the group (of three) girls is not partitioned into atoms and that the respective agent of each subevent is a group of three girls carrying simultaneously (together or in non-atomic groups of two and one) two different boxes (per subevent). The ensuing reading is equivalent to distributing events (of three girls carrying two boxes) over spatial locations, i.e. two (or more) carrying subevents are spatially but not temporally separated (that is, are happening simultaneously) - so the spatial event-distributive reading arises.

Finally, suppose again that the group of three girls is not partitioned into atoms and that the agent of each subevent is a group of three girls carrying (together, in non-atomic groups or individually) two different boxes per event, each of which has different running time. This would be the case in a scenario where say the three girls carry two (different) boxes (at least) twice during the course of the week. Thus, the temporal event-distributive reading arises.

Let us now see how the semantics in (23) contributes to the meaning of the sentence with *NumRed* in subject position in (26).

(26) a.

θlaθa	**θlaθa**	**n**	**təqʃiʃin**	rəfð-ənt	snaθ
three	three	Gen	CS.gil.PL	Carry.PFV-3F.PL	two.F
n	təbwaḍin				
Gen	FS.box.F.PL				

Lit. **Three three girls** carried two boxes.

b. λe. e ∈ *Ɛ3girls & e ∉ Ɛ3girls & *carry(e)
& ∃x *girl(x) & Agent-sum(e)(x) & ∃y*box(y) & | At(y) | = 2 & Theme-sum(e)(y)

c. There is an event constructed out of (sub)events each involving three girls, and this is an event of girls cumulatively carrying two boxes.

In (26a), since *Red* combines with the NP "three girls", there must be at least two subevents each involving a different set of three girls carrying two boxes.

First suppose that the set of two boxes is itself partitioned atomically and each box atom was carried by three different girls. Then the so-called participant-distributive reading arises since the ensuing reading is tantamount to distributing three girls over individuals (box) atoms.

Now suppose that the group (of two) boxes is not partitioned into atoms and that the respective patient of each subevent is a group of two boxes being carried together (per subevent) and simultaneously. The arising reading is spatial event-distributive - where (at least) two carrying subevents are spatially but not temporally separated.

Finally, suppose that there are carrying events, such that in each subevent there are three girls carrying two boxes (two boxes per group of girls or two boxes in total in all subevents), happening in different time intervals. Then the temporal event-distributive reading arises.

Finally, let us examine how the semantics in (23) applies to the sentence with *NumRed* in both subject and object positions in (27).

(27) a. **θlaθa** **θlaθa** **n** **təqʃiʃin** rəfð-ənt **snaθ** **snaθ**

three three Gen CS.girl.PL carry.LPFV-3F.PL two.F two.F

n **təbwaḍin**

Gen FS.box.F.PL

Lit. **Three three** girls carried **two two boxes**.

b. λe. e ∈ *Ɛ3girls & e ∉ Ɛ3girls & e ∈ *Ɛ2boxes & e ∉ Ɛ2boxes & **carry*(e)
& ∃x **box*(x) & Theme-sum(e)(x) & ∃y **girl*(y) & Agent-sum(e)(y)

c. There is an event constructed out of (sub)events each involving three girls and two boxes, and this is an event of girls cumulatively carrying two boxes.

In (27a), *Red* combines with the NP "three girls" and with the NP 'two boxes', so there must be at least two subevents each involving a different set of three girls and a different set of two boxes. In other words, since 'three girls' and 'two boxes' are both marked for distributive-share (need to be distributed), they need to be participants in each subevent. That is to say, they must both be distributed to times intervals/locations. Consequently, the arising readings are event-distributive (spatial or temporal).

Consider the scenario under which there is a plural event constructed out of subevents such that in each subevent the set of three girls and the set of two boxes participate and the subvenets are happening simultaneously but are spatially separated. Then the spatial event-distributive reading arises.

Now suppose that in each subevent there is a plural event constructed out of subevents such that in each subevent the set of three girls and the set of two boxes participate at the same place but at different time intervals. The arising reading is the temporal event-distributive.

The reader may apply the semantics of *Red* in (23) to calculate the meanings of transitive sentences with one singular argument, yielding only temporal event-distributive readings and with intransitive sentences, yielding spatial and temporal event-distributive readings (see section 3.2.). Note that, under our analysis, *Red* contributes to the meaning of a sentence by conveying that there is a plurality of events, each involving *n*NP. We can say that the obtained plurality of events is constructed out of atomic events that must be separated, temporally or spatially (be it with atomic or non-atomic participant separation). However, the analysis does not account completely for this 'separation' requirement. Notice that this separation requirement is a property of pluractionas (Lasersohn 1995, Matthewson 2000). When it comes to pluractionals, Lasersohn (1995) proposes that the (sub)events must not overlap in at least one of three criteria, as shown in (28).

(28) Pluractional morphology in Lasersohn (1995)

a. V-PA (X) ⇔∀e, e' ∈ X [V(e) & ¬τ (e) ° τ (e')] & card(X) ≥ n

b. V-PA (X) ⇔∀e, e' ∈ X [V(e) & ¬K (e) ° K (e')] & card(X) ≥ n

c. V-PA (X) ⇔∀e, e' ∈ X [V(e) & ¬θ (e) ° θ (e')] & card(X) ≥ n

(28) says that a pluractional verb (V-PA) holds of a group of events (X) if and only if it holds of each (sub)event *e* which is a member of X. The remainder states that the (sub)events must have non-overlapping running times (28a), running spaces (28b) or thematic roles (28c). The non-overlapping/separation requirement is guaranteed by the meaning of a particular pluractional morpheme which is different in (28a), (28b) and (28c). As we have seen, we do not have different morphemes for different readings, namely the morphemes involving separate running times (28a), separate locations (28b) or separate thematic roles (28c). It is *Red* that is responsible for any of those readings. In other words, the semantics of *Red* enforces rather weak truth conditions, which permit a variety of different event-distributive readings - spatially and/or temporally separated events (involving atomic or non-atomic participants). Therefore, the semantics of *Red* does not predict when the spatial (and participant) distributive readings are not available. This may be augmented in (23). Or, we can speculate that this issue may be related to predicate types, (in)transitivity, argument structure and (the alternative of) verbal reduplication, but a serious investigation of this broad phenomena, far beyond the topic of this paper, is necessary to answer these questions.

We have shown that the semantics proposed for *Red* in (23) accounts for readings of sentences with *NumRed*. It correctly predicts that all sentences with *NumRed* yield event-distributive readings. More precisely, it claims that the truth of sentences with *NumRed* in both types of scenarios (participant-distributive and event-distributive) derives from one and the same interpretation involving a cumulation of events. In this way, we account for the meaning of sentences with *NumRed* without presuming an ambiguity.

5. Conclusion

We have shown that *NumRed* in Taqbaylit systematically involves event plurality. The sentences with *NumRed* yield distributive interpretations as a result of temporal and/or spatial separation of multiple events. Furthermore, we have shown how participant separation of events is reducible to the spatial separation, since different spatial locations of the (groups of) participants are precisely the salient criterion for separation of relevant locations of the (sub)events. This rightly predicts that some sentences only yield temporal-distributive readings, since spatial separation of subevents is impossible due to the lack of a plural participant.

We have provided an analysis of *Red(uplication)* as a plurality marker. In a nutshell, we have claimed that the events described by the sentences with *NumRed* must be *constructed out of* events involving exactly *n* such individuals, that is, must involve at least two (sub)events that are spatially or temporally separated, each of which must involve *n*NP(s). The resulting sentence will be true under various scenarios, as long as the described events involving *n*NP(s) have different running times and/or running spaces. Essentially, *Red* contributes to the meaning of a sentence by conveying that there is a plurality of events, each involving *n*NP(s).

The aim of our investigation of *NumRed* in Taqbaylit has been to contribute to the novel insights into distributive numerals and pluractionals across languages, as well to open the door to more investigation of reduplication, distributivity and pluractionality in the Berber languages.

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