The problem of Quechua *-nka*
Distributivity vs. group forming

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This paper studies the meaning of Quechua suffix *-nka*, which is traditionally referred to as a distributive marker. This suffix can occur in sentences that do not appear to be distributive, and which have a group reading. In this regard, *-nka* is similar to Korean *ssik*. The meaning of *-nka* is approached through a comparison with *ssik*. It is argued that despite the similarities, the analyses proposed for *ssik* are not transferable to *-nka*. A proposal is made that analyzes the group reading associated with *-nka* as a special instance of a standard distributive relation, in which one of its arguments is supplied by context.

1 Introduction

This paper discusses the meaning of the Quechua suffix *-nka*, which in traditional grammars and Quechua text books has been called a distributive marker (Cusihuaman 1976, Soto Ruiz 1993). Apart from descriptions in reference grammars and text books, there exist to my knowledge no previous theoretical study on the encoding of distributive relations in any of the Quechua dialects.[1] The present study can therefore only be considered a first step on the way to understanding how distributivity is encoded in Quechua. Cusco Quechua possesses three morphemes to mark distributive relations: (i) *-nka*, the object of study in the present paper, (ii) the prenominal quantifier *sapa* which corresponds roughly to prenominal English *each*,[2] and which often co-occurs with *-nka*, and (iii) the suffix *-kama*, which is used instead of *-nka* to mark distributive relations between a possessor and a possessee. The examples in (1) and (2) illustrate the distributive uses of these morphemes.

(1) Irqi-kuna kinsa t'ika-**nka**-(ta) chura-rqa-nku.
child-PL three flower-**nka**-ACC plant-PST-3PL.

(i) '(The/Some) children planted three flowers each.'
(ii) '(The/Some) children planted flowers in threes.'[3]

[1]Quechua is a language family spoken throughout the Andes. The data presented in this paper are from the Cuzco-Collao dialect, and were collected by the author in Cuzco, Peru, by elicitation from bilingual Quechua/Spanish consultants.

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[2]It is not yet well established whether *sapa* and other Quechua prenominal quantifiers such as *llapa - all* or *pisi - few* are determiners or adjectives. *sapa* and *-kama* also have non-distributive uses.

[3]Quechua does not possess definite or indefinite articles (though the numeral *huk - one* appears to have

(2) a. **Sapa-(nka)** irqi kinsa t'ika-ta chura-rqa-n.
each-**nka** child three flower-ACC plant-PST-3
'Each child planted three flowers.'

b. Tura-y-kuna kinsa wawa-yuq-kama.
brother-1-PL three child-POSS-**kama**
'My brothers have three children each.

In this paper, only *-nka* will be discussed. Typically, *-nka* occurs in transitive sentences like (1a). In this use, *-nka* is usually interpreted in the same way as English shifted *each*, as indicated in the gloss in (1)(i), i.e. the sentence receives a *distributive interpretation*.

In contrast to English shifted *each*, however, *-nka* can also occur in intransitive sentences such as (3). The resulting reading is not one that is usually associated with the term *distributivity*, and I will therefore call it the *group reading* to distinguish it from the typical distributive interpretation (1)(i). In fact, the group reading is also available for transitive sentences, as indicated in (1)(ii), but it is much less prominent than the distributive reading.

(3) a. Kinsa irqi-kuna-**nka** tiya-sha-nku.
three child-PL-**nka** sit-PROG-3PL
'(The/Some) children are sitting in groups of three.'

b. Kinsa t'ika-**nka** aswan munaycha-n iskay t'ika-**nka**-manta.
three flower-**nka** more pretty-DE two flower-**nka**-ABL
'(The) Flowers in threes are prettier than flowers in twos.'

The intuitive difference between the distributive and the group interpretation of a sentence containing *-nka* is as follows. The distributive interpretation involves a relation between two sets of individuals such that a determinate number of members x of the first set is "related" to each member y of the second set, in standard terminology the first set *distributes over* the second set, such that x and y stand in the relation denoted by the verb. In (1)(i) the flowers are distributed over the children, such that each child plants three flowers. Choe (1987) introduced the terms *distributive share* and *sorting key* to refer to the first and second set respectively. An intuitive way to paraphrase a distributive relation is with *per*: three flowers per child.[4]

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taken on an indefinite meaning). Whether or not a given NP is to be understood as definite or indefinite is usually clear from the context.
In the presence of *-nka*, the accusative marker *-ta* is optional.
The following abbreviations are used in the glosses: 3SG: 3rd person singular, ABL: ablative, ACC: accusative, CL: classifier, COMP: complementizer, CONTR: contrastive, DE: direct evidence, DEC: declarative, DIR: directional, EUPH: euphonic, 3FUT: 3rd person future, NOM: nominative, 1.PL.INCL.FUT: 1st person inclusive future,3PL: 3rd person plural, PL: plural, POSS: possessive, PROG: progressive, PST:pst, PST2: non-experienced past tense, TOP: topic

[4]A slightly different way of describing a distributive relation is to say that the predicate applies to each member of the sorting key, i.e. in (1)(i) the predicate *planting three flowers* is claimed to be true of each child. This way of characterizing distributivity is necessary to talk about distributivity in intransitive sentences such as *The children won*, which on its distributive interpretation means that each of the children won in a separate competition, as opposed to winning as a team.

The interpretations of (3a,b) do not immediately fit this picture of a distributive relation. Though we can talk in these cases about *three children per group* or *three flowers per spot*, the "key", a set of groups or a set of spots, is not provided by an NP in the sentences. Furthermore, the "key" and "share" do not map onto two different arguments of the verb, but together constitute a single argument. A perhaps more intuitive way of describing these interpretations is to say that the set of individuals denoted by N is being divided up into multiple subsets or groups of a given cardinality. Thus, in (3a), the set of children is divided up into groups of three children.

Group readings of sentences with distributive markers have not received much attention in the literature on distributivity. This may partly be due to the fact that group readings are often indistinguishable from more familiar kinds of distributive readings, and partly to the fact that (formal) studies of overt markers for distributivity tend to focus on familiar languages, in particular English *each*, which does not allow group readings.

However, group readings with distributive markers are not uncommon cross-linguistically. Gil (1990) lists the following languages as possessing distributive markers which allow group readings: Japanese, Korean, Rumanian, Georgian, Gã, and Maricopa.

The research question addressed in this paper is whether or not the distributive reading and the group reading associated with *-nka* sentences can be derived from a single meaning for *-nka*, and if so how. This formulation of the research question presupposes that *-nka* is in fact semantically responsible for the two readings, and I will provide arguments for this assumption.

As there have been no previous theoretical proposals for the meaning of *-nka* within which the present discussion can be framed, I will approach it by comparing it to Korean *ssik* which exhibits a similar range of meanings as *-nka*. For *ssik*, two fundamentally different analyses have been offered in the literature, both of which propose a single semantics for *ssik*. The first analyzes it along the same lines as English shifted *each*, i.e. as an overt marker of distributivity (Choe 1987). In order to accommodate the group reading Gil (1990) extends Choe's analysis and introduces a new kind of distributive relation: *NP-internal* distributivity.

The second view denies that *ssik* is a distributive marker altogether, and proposes to analyze it as a so-called multiple group forming device instead (McKercher and Kim 1999). The distributive readings that arise in sentences with *ssik* are in this account attributed to mechanisms other than *ssik*.

I will show that despite the similarities between *ssik* and *-nka*, neither of these two proposals captures the meaning of *-nka*. I argue that *-nka* is essentially a distributive marker and that the group interpretation can be derived from a single semantics, if we allow the context to provide one of the arguments of the distributive relation. This has been proposed by Link (1998) to account for certain readings associated with the German distributive marker *je*.

The aim of this paper is to give an overview of the main issues involved in determining the meaning of *-nka*, and to make a first proposal. The next section presents Korean data, and discusses two proposals for meaning of the suffix *ssik*, which exhibits a similar range of meanings as *-nka*. I will then show in section quech that there are empirical differences between *-nka* and *ssik*, which, as I will argue in section 4, make it impossible to adopt the Korean analysis for *-nka*. In section 4 I also propose an analysis for *-nka* along the lines of a proposal by Link (1998) for the German distributive operator *je*. I conclude in section 5)

by situating Quechua within the NP typology proposed by Gil (1990).

2 Analyses of group readings in Korean

The previous analyses of group readings to be discussed here have been proposed by Gil (1990) for Korean *ssik* and Japanese *zutu* and by McKercher and Kim (1999) for Korean *ssik*. I will only present Korean data.

Korean sentences with *ssik* exhibit a similar range of readings as the Quechua data in (1) and (3). Gil (1990) discusses the example in (4), for which he gives the three readings in A, B and C

(4) salam twu myeng-i kapang sey kay **ssik**-ul wunpanha-ess-ta
man two CL-NOM suitcase three CL **ssik**-ACC carry-PST-DEC

'Two men carried three *ssik* suitcases.' (Gil 1990)

A. Two men carried three suitcases each; the number of suitcases carried is six.

B. Two men carried the suitcases three at a time (individually or collectively); the number of suitcases carried is $3n$, where n is the number of events as determined by the context.

C. Two men carried sets of three suitcases (individually or collectively); the number of suitcases carried is $3n$, where n is the number of sets of suitcases with cardinality 3 as determined by the context.

Both readings A and B are typical distributive interpretations, involving a relation between a distribute share and a sorting key. They differ in that in A, the sorting key is a set of individuals (*two men*), while in B it is a set of events. These two readings are analyzed in detail by Choe (1987), but Gil (1990) was the first to discuss and propose a line of analysis for the group reading in C. Gil points out that readings B and C are often hard to distinguish. In neither case can the total number of suitcases be determined, and the scenarios that come to mind most easily for both involves a group of three suitcases per carrying event. However, the two readings are truth-conditionally distinguishable. Reading C would be true in a situation in which the two men together struggled with 15 suitcases which are bundled into groups of three in one carrying event, but reading B would be false in this situation. Furthermore, B entails a plurality of events, whereas C does not. Gil also observes that the direct object NP containing *ssik* in C does not feel elliptical, i.e. it is an independently referring expression. Compare this for example with the interpretation of *three suitcases each* in the English gloss in A, which is dependent on the interpretation of the subject NP.

That the group reading cannot be identified with distribution over events can most clearly be seen with sentences like (5).

(5) a. John-i sakwa-lul sey-kay-**ssik** nanu-ess-ta
John-NOM apple-ACC three-CL-**ssik** divide-PST-DECL

'John divided the apples into groups of three.'

b. sensayngnim-un haksayng sey-myeng-**ssik**-i iss-ul ttay kipwun-i
teacher-TOP student three-CL-**ssik**-NOM be-COMP when feeling-NOM
coh-ta
good-DECL

'The teacher is happy when the students are in groups of three.'
(McKercher and Kim 1999)

In (5a) it does not make sense to say that there were three apples per dividing event, and the stative verb in (5b) does not allow a plurality of events. The group reading can therefore not be reduced to distribution over events. Thus, the analysis Choe proposed for *ssik* as a marker for a distributive relation between two sets of individuals or a set of individuals and a set of events cannot account for the group readings.

The question of how the group readings associated with *ssik* can be derived has been addressed by Gil (1990) and by McKercher and Kim (1999). While Gil (1990) maintains that *ssik* is essentially a marker for distributivity, McKercher and Kim (1999) take the forming of groups to be the main function of *ssik*. Let me briefly present the two proposals in turn.

Gil (1990) builds on Choe's (1987) analysis of *ssik* as an overt marker of distributivity, and proposes to analyze the group reading as *NP-internal* distributivity. NP-internal distributivity differs from the usual *inter-phrasal* distributivity in that it holds between the constituents of an NP: the numeral distributes over its head noun. With this analysis of the group reading, the meaning of *ssik* (and *zutu*) can be characterized across all its uses as follows: "[...] a constituent containing *zutu/ssik* distributes over a semantically plural constituent Y disjoint from X."(Gil 1990:387).

The following quote from Gil (1990:387) illustrates what he means by distributing the numeral over its head noun. It deals with Japanese, but equally applies to Korean.

> [...] note that in Japanese and Korean, nouns are characteristically construed as *mass*. [...] In order to count *sutukeisu* [the Japanese word for suitcase, M.F.], it is therefore necessary to endow it with further structure–and this is accomplished by means of the numeral classifier *ko*, yielding the phrase *sutukeisu sanko* "three units of suitcase-mass". Now since *sutukeisu sanko* contains no marker of distributivity, the numeral-plus-classifier phrase *sanko* applies collectively to its head *sutukeisu*, and the suitcase-mass is, in its entirety, of three units. However, when *zutu* is affixed, the resulting numeral-plus-classifier phrase *sanko-zutu* distributes over its head *sutukeisu*. To interpret this, it is necessary to partition the suitcase-mass into an arbitrary number of constituent parts, or suitcase submasses, over which *sanku-zutu* may distribute. As a result, each of the suitcase sub-masses is of three units, or more simply, of cardinality three.

In other words, without *ssik/zutu*, we have three units per suitcase-mass, and with *ssik/zutu*, we have three units per suitcase sub-mass to render reading (4) C or its Japanese counterpart. To render reading A, we would have three units per suitcase-mass per man or rather three units per suitcase-mass per each of two units of man-mass.

Gil (1990) does not discuss how NP-internal distributivity is to be understood in languages without classifiers.[5]

The result of NP-internal distributivity in (4) is that an indeterminate number of sets of suitcases of cardinality three are formed. McKercher and Kim (1999) develop an analysis of Korean *ssik* that takes this observation as its basis. In their account, *ssik* is not a distributive marker at all, but a so-called multiple group-forming device. Its only function is to divide the set denoted by its head noun into groups whose cardinality is determined by the numeral or cardinal quantifier it attaches to. In (5)a, for example, *ssik* divides an unspecified number of apples into groups of three.

The distributive interpretations of sentences containing *ssik* arise independently of *ssik* by the same general mechanisms (scope interactions and pluralities) that induce distributive interpretations for sentences without it or any other overt marker for distributivity. Thus, (4) without *ssik* can still be interpreted as either A or B, but crucially not as C.[6]

In Korean, a second numeral can be added to the NP containing *ssik* as illustrated in (6), which counts the number of groups.

(6) Na-nun chayk-ul sey-kwen-**ssik** ney-mwukkum sa-ss-ta
I-TOP book-ACC three-CL-**ssik** four-CL

'I bought four sets of three books.' (McKercher and Kim 1999)

In both Gil's (1990) and McKercher and Kim's (1999) analysis, the phrase *chayk-ul sy-kwen-ssik* ends up denoting a set of groups of three books. Thus, both analyses can account for the fact that a second numeral can be added to count the number of groups in this set.

The Korean data is of course more complicated than the data presented here can illustrate. For example, it is also possible that *ssik* occurs in the subject NP, and that it occurs on both the subject and the object NP. The reader is referred to Gil (1990) and McKercher and Kim (1999) for more data.

In the next section, I will discuss the Quechua data involving *-nka* in light of the preceding discussion on Korean.

3 Is Quechua *-nka* like Korean *ssik*?

At the beginning of this paper, I presented examples with *-nka* that showed that it like Korean *ssik* can occur in sentences with distributive and group readings. These examples are repeated in (7) for convenience.

[5]He does intent NP-internal distributivity to account for the group readings observed with distributive marker in the other languages he mentions. And as far as I can gather from the data he provides, these languages do not have classifiers.

[6]Gil (1990) could account for this by requiring that NP-internal distributivity is necessarily lexically induced.

One potential problem with McKercher and Kim's (1999) account is how they can limit the number of suitcases involved in the event in (4) to six under interpretation A, and to 3 per event under interpretation B. Since *ssik* is claimed to be group forming in all its uses, the NP *three-ssik suitcases* will also denote a set of groups of three suitcases in A and B. The number of groups is however left unspecified. That is, when distributing this set over the sorting key *two men* to derive A, we do not know how many groups of three suitcases there are per man. As far as I can tell, the semantics would not prevent us from assigning more than 1 group to each man.

(7) a. Irqi-kuna kinsa t'ika-**nka**-(ta) chura-rqa-nku.
child-PL three flower-**nka**-ACC plant-PST-3PL.

(i) '(The/Some) children planted three flowers each.'
(ii) '(The/Some) children planted flowers in threes.'

b. Kinsa irqi-kuna-**nka** tiya-sha-nku.
three child-PL-**nka** sit-PROG-3PL

'(The/Some) children are sitting in groups of three.'

c. Kinsa t'ika-**nka** aswan munaycha-n iskay t'ika-**nka**-manta.
three flower-**nka** more pretty-DE two flower-**nka**-ABL

'(The) Flowers in threes are prettier than flowers in twos.'

All examples in (7) have a group interpretation, though for (7a) it is only a marginal interpretation.

As with Korean *ssik*, we must consider the possibility that the group reading can be reduced to distribution over events. That this is not possible is shown for example by (7c), which contains a stative verb, and thus no plural event variable.[7]

Further examples that show that the group reading with *-nka* is distinct from distribution over events are given in (8).

(8) a. Pilar manzana kinsa-**nka** t'aqa-sqa.
Pilar apple three-**nka** separate-PST2

'Pilar separated (the) apples into groups of three.

b. Iskay wach'u-**nka** tarpu-sunchis.
two row-**nka** sow-1.PL.INCL.FUT

'We will sow groups of two rows.

In (8a) we have the verb *t'aqay* which by consultants is translated into Spanish as *separar, dividir*, i.e. *separate, divide*. As with the Korean example in (5a), it does not make much sense to say that there are three apples per dividing event.[8]

The verb *tarpuy - sow* in (8b) does in principle allow distribution over sowing events (once we have managed to clearly define what constitutes a sowing event). However, it also has a reading which cannot be understood as such: let's say you and I are sowing a field and agree on (8b). You, as an orderly person sow two rows that are next to each other and take a break, then sow two other rows next to each other, making sure to leave two in between for me to sow, and so on. You may be said to do two rows per sowing event. I on the other sow half a row, then take a break, then jump to my next pair of rows and do a row there, then go back to the first two rows doing the second one, jump again, and so on in a very erratic fashion. My behavior can hardly be described as sowing two rows per

[7]Though one might perhaps argue that there is a different state of *being prettier* for each group of three flowers.

[8]Note, however, that *t'aqa* as a noun means *group*, and it is possible that *t'aqay* really means something like *make groups* rather than *separate*. If this is the case, then (8a) is indeed identical to distribution over events, as there are indeed 3 apples per group making - unless somehow it all happens in one event.

sowing event. Nevertheless, (8b) is licensed even in this situation, if the end result is that there are alternating pairs of rows such that you have sowed one pair, and I the next etc. The meaning of (8b) in this situation is clearly not two rows per sowing event, but two rows per group of rows.

Thus far, *-nka* is just like Korean *ssik*: both appear in sentences with distributive readings and group readings, and for neither can the group reading be identified with distribution over events. However, there are also significant differences.

First, transitive sentences without *-nka* and without any other distributive marker such as *sapa* or *-kama* or another type of quantifier, can usually not be interpreted as involving a distributive relation between two NPs.[9] Thus, (7)a. without *-nka* can only mean that the children together planted a total of 3 flowers. Rachel Hastings in her talk at SULA presented the following example also from Cusco Quechua.

(9) Tukuy llama-kuna huk platanu-ta mikhu-rqa-nku.
all llama-PL one banana-ACC eat-PST-3PL

'All llamas ate one banana (each/together)'

Examples (9) does not contain *-nka*, but can nevertheless receive a distributive interpretation. This, I believe, is due to the presence of the quantifier *tukuy - all*. Without it, it could according to my consultants only mean *(The/Some) llamas ate one banana (together).* Replacing *tukuy* with *sapa - each* disambiguates (9) in favor of the distributive interpretation. Thus, to get a distributive interpretation without *-nka* or *-kama*, a universal quantifier in the sorting key NP is required.[10]

A second difference with Korean *ssik* is that stacking of numerals in the NP containing *-nka* is not possible. The Quechua equivalent of Korean (6) is not grammatical.

[9]This is not the case when the distributive share is denoted by a simple predicate. For example, (i) can mean that each of Pilar's children won in a separate competition, as well as that they won as a team.

(i) Pilar-pa irqi-n-kuna llalli-rqa-nku.
Pilar-POSS child-3SG-PL win-PST-3PL

'Pilar's children won.'

[10]For some consultants, even (9) with *tukuy* can only receive a collective interpretation. Without a quantifier such as *tukuy*, the distributive reading cannot be forced even by making the collective interpretation pragmatically highly unlikely. For example, I presented my consultants with the following short conversation between A and B. A: *How many rolls do we have to buy for the party?* B: *I don't know, let's see. There are going to be 20 adults and 10 kids. The adults eat 3 rolls and the kids eat 2. So we have to buy 80 rolls.* The crucial sentence in Quechua is:

(i) Runa-kuna kinsa t'anta-ta-n mikhu-nqa-ku, irqi-kuna-taq iskay-ta-n.
person-PL three bread-ACC-DE eat-3fut-pl child-PL-CONTR two-ACC-DE

'The adults will eat three rolls, and the children two.

Consultants reject speaker B's conclusion. B should have concluded that they had to buy 5 rolls. Only after adding *-nka* to the NPs *three rolls* and *two* in (i), the conclusion becomes valid. While the English text could maybe be improved by adding *each*, this is not obligatory, and B is certainly entitled to conclude that they have to buy 80 without it.

(10)# Tawa kinsa liwru-**nka** ranti-rqa-ni.
four three book-**nka** buy-PST-1

(intended:) 'I bought four sets of three books.'

Furthermore, while the group reading is the only interpretation available for (7b,c), using *-nka* this way is not the usual way to express it. When asked to translate the Spanish equivalent of *The children are sitting in threes*, *Los niños están sentados de tres en tres*, consultants usually offer something like the following:

(11) Irqi-kuna-qa kinsa kinsa-manta tiya-sha-nku.
child-PL-TOP three three-ABL sit-PROG-3PL

'(The/Some) children are sitting in threes.'

Gil (1990) and McKercher and Kim (1999) do not say whether or not the use of *ssik* is the typical way of expressing the group reading, and do not mention other ways. If it is the typical way, then this is a further difference with Quechua *-nka*.

An additional piece of data that an analysis of *-nka* has to account for is interpretation (ii) of (12).

(12) Kinsa t'anta-**nka**(-ta) mikhu-rqa-ni.
three bread-**nka**-ACC eat-PST-1

(i) ? 'I ate breads in threes.'
(ii) 'I ate three rolls of each kind.'

Consultants generally reject interpretation (i) and often even deny the grammaticality of (12). Those consultants that do accept it as a well-formed sentence give interpretation (ii) as its meaning. One possible explanation for this is that (12)(i) is pragmatically very unlikely. However, this is not the case for (13).

(13) Chunka kaset-ni-**nka**-(ta) ranti-rqa-ni.
ten cassette-EUPH-**nka**-ACC buy-PST-1SG

(i) ? 'I bought cassettes in tens.'
(ii) 'I bought ten cassettes of each kind.'

Example (13) was intended to capture a real life situation, as the cassettes I used during sessions with consultants are sold in boxes of ten. Nevertheless, those consultants that accepted (13) at all, only did so under interpretation (ii), where *of each kind* is usually taken to mean *of each make*. I can at this point not offer an explanation for the unavailability of interpretation (i) for (12) and (13).[11] The point I want to make here is that *-nka* sentences can sometimes receive what I will call for now a *kind reading*.[12]

[11]One hypothesis is that we are dealing with a subject/object asymmetry. However, (8) and the group interpretation of (7a) are counterexamples to this hypothesis. One can furthermore speculate that the group reading is only available when the relevant groups are formed as a result of the "action" denoted by the verb. Thus, in (7a)(ii), we have groups of three flowers as a result of the children planting them in that way, in (7b) the groups of three children exist because they sit that way, and in (8b) we end up with groups of rows of two, because that is the way we sowed them. In (12) and (13) the action does not create the groups, because the groups already exist before. However this line of explanation cannot account for (7c).

[12]More data is needed to determine whether the kind reading is available for all sentences containing *-nka*.

In the next section I will argue that the two analyses proposed for Korean *ssik* cannot be applied as they are to *-nka*.

4 Towards an analysis of *-nka*

In the previous section, I gave a number of differences between *-nka* and Korean *ssik*. These differences are arguments against adopting McKercher and Kim's (1999) analysis for *ssik* as a multiple group forming device for Quechua *-nka*. As I have shown above, without *-nka* a distributive relation between two NPs is only possible if one of them contains another distributive marker or at least a quantifier. Since the addition of *-nka* to an otherwise non-distributive sentence induces distributivity, the meaning of *-nka* has to be distributive.

To account for the group readings with *-nka*, we might consider the possibility that *-nka* is ambiguous between a distributive marker not unlike *each* and a multiple group forming device in McKercher and Kim's (1999) sense. However, given that *-nka* is not the typical way of expressing group readings in Quechua, it would be rather strange to claim that group forming is the main and only function of *-nka*, even if we claim this only for one of its meanings. Furthermore, if we analyze *-nka* as a group forming device, we predict that numerals should be stackable, and we have seen that this is not the case.

Gil's (1990) analysis for Korean *ssik* appears to be more suited to account also for *-nka*, as group forming is considered a special type of distributivity. This would capture the fact that *-nka* is most typically used as a distributive operator, and only in some uses acquires a group reading. Unfortunately, NP-internal distributivity cannot be made to work for *-nka* either.

As we have seen in section 2, Gil's account also predicts the possibility of stacked numerals. In order to apply it to Quechua *-nka*, which does not allow stacking, we would at the very least have to modify NP-internal distributivity in such a way as to prevent that possibility. I will not explore here how this could be done, as the concept of NP-internal distributivity as such is not applicable to Quechua.

Quechua does not possess classifiers, and it is therefore reasonable to assume that nouns denote sets of individuals. As described in section 2, NP-internal distributivity in Korean and Japanese, where common nouns are mass, can be paraphrased as n things per N sub-mass.[13] What would it mean to distribute a numeral over its head noun for Quechua? I assume that a plural common noun denotes a set of individuals plus their sums (Link 1998, Landman 1996). Recall that distributivity is a relation between sets such that a determinate number of the first set, the distributive share, are assigned to each member of the second set, the sorting key. Assume furthermore that a numeral n in Quechua is non-quantificational, but denotes a set of sums of cardinality n. Distributing this set over the plural common noun would mean that we assign a determinate number of sumss of cardinality n to each member of the set denoted by the plural common noun, i.e. to each individual and to each sum. This, however, does not result in group forming.

[13] In order for this to work, the mass of N has to be cut up into sets of n units. This in turn requires that each sub-mass be of the right "size" to yield n units. In other words, how we divide the entire N into sub-masses is only determined at the point of carrying out the distribution. Cutting out a mass into specific "shapes" is the job of classifiers in general. Thus, NP-internal distributivity may indeed be said to be parallel to regular distributivity.

What NP-internal distributivity would have to amount to with set denoting common nouns in order to form groups, is for the numeral+*-nka* combination to collect all the sums of cardinality n from the denotation of the plural N into a set, but this could hardly be called distributivity. So, while group forming of mass nouns might be said to be a process parallel to more common types of distributivity, group forming of set denoting nouns is quite a different matter. It is therefore hard to see how group forming and regular distributivity could be captured in a single meaning representation for *-nka*.

Furthermore, neither the NP-internal distributivity nor the multiple group forming analysis can deal with the kind readings observed for (12) and (13). While the set of groups resulting from these two mechanisms captures the meaning *n N per group* associated with group readings, it does not capture the meaning of *n N per kind*.

To summarize briefly, *-nka* is inherently distributive, and can therefore not be given a pure multiple group forming semantics. Incorporating group forming into a regular distributive semantics via NP-internal distributivity does not work for set-denoting nouns. Resorting to an ambiguity analysis of *-nka* is also not a solution, since *-nka* is not the standard way of expressing group forming and group forming should therefore not be treated on par with its distributive meaning.

What we need for *-nka* is a distributive semantics that allows the group and kind readings as marked cases, and which does not open up the possibility of stacking numerals. Any kind of analysis that introduces a set of groups of cardinality n directly into the semantics - as both the multiple group forming and NP-internal distributivity analyses do - does open up the possibility that the groups themselves be counted by a second numeral, and would require an additional mechanism to make it inaccessible to numerals.[14]

Before I argue for a third option for deriving the group reading with *-nka*, let me first discuss the notion of a group. Landman (1989:589) characterizes a group as follows:

> Groups, like the Democrats, are individuals collected together under a certain aspect (**being a Democrat**). Through this aspect (which is an intentional notion), the group is individuated as an entity that is more than the sum of its parts, that is in certain aspects independent of its parts: in the group, so to say, the part-structure is wiped out.

The point I want to extract from this quote is that groups as set-theoretic or lattice-theoretic concepts do not tell us anything about how membership in these groups is determined. When people talk about groups, however, they rarely talk about mathematical groups, but about groups whose members have something in common other than being in the same group. Landman calls this defining property an *aspect*, and I adopt his terminology.

With group denoting nouns, the aspect under which the individuals are collected is provided by the lexical semantics of the noun itself: the Democrats form a group because all its members are Democrats. However, this is not the case for the groups formed in the group readings with *ssik* or *-nka*. The groups of 3 children in (7b) for example, are not defined by the fact that their members are children, or even that they are three children. The groups

[14]Of course, one could simply say that stacking of numerals is disallowed for syntactic reasons. However, if we adopt an analysis of numerals as adjectives, which I believe to be the right analysis for Quechua, then the syntax does not directly prohibit stacking.

are defined by the fact that their members are sitting together in (7b), that the flowers in (7a) are planted in the same spot, or that the flowers in (7c) are in the same vase, the same bushel or the same spot. The same holds for kind readings: the groups of rolls and cassettes in (12) and (13) are defined by the fact that their members belong to the same kind, not by the fact that all the members of each group are rolls and cassettes.

Where then do these aspects come from? In many cases it seems to be possible to derive the relevant aspects from the truth conditions of the verb as it applies to a group. In McKercher and Kim's (1999) analysis of (5a) for example, the semantic representation contains a set of groups of three men. As in Landman's account, groups are considered atomic individuals (as opposed to sums) and are as such in the denotation of the verb phrase *be sitting*. One can now argue that the truth conditions for *be sitting* applied to a group require the individual members of that group to be sitting together, rather than just to be sitting as is the case when the predicate *be sitting* is applied to a single individual.

Similarly, we might want to say that, *being planted* applied to a group of flowers is true iff they are planted in the same spot, and thus account for the fact that the groups in (7a) are defined by the aspect of being in the same spot.

As far as I can tell, Gil (1990) and McKercher and Kim (1999) would have to say something along these lines to derive the relevant aspects.

However, in Quechua at least, it is not always the verb semantics that provides the relevant aspect. Thus, the groups in the examples in (8) are not defined by an aspect that is provided by applying the verbs *divide* and *sow* to a group of apples or rows. For examples (8), the aspect is that the members of each group have to be in close proximity, and clearly distinguishable from the other groups. In fact, the latter is also required for the groups of sitting children in (7b), i.e. each group has to be clearly identifiable as a group apart from the other groups. Imagine 21 children sitting in a circle. Then we have 7 groups of 3 children each, the members of which are sitting together. Nevertheless, these children are not (necessarily) sitting in groups of three. The requirement that one group be clearly distinguishable from the other groups does not come for free with the verb semantics applied to a group, as it is impossible to make reference to other groups when stating the truth conditions. Now, something that makes the groups of apples in (8a) and the groups of children in (7b) distinct from one another is to introduce additional features. We can imagine each group of apples to form a pile, and each group of children to be sitting around a table. In fact, this is what consultants confronted with group interpretations immediately do, when not provided with a context.

For kind readings, the aspect of being of the same kind can also not be derived from the verb semantics. Those aspects that we could reasonably derive from the truth conditions of applying *eat* and *buy* to a group are *eating as a group* (i.e. in one go) and *buying as a group*, which recall, are highly dispreferred interpretations for the examples in (12) and (13).

Now, in a sense, all kinds of distributivity involve multiple groups, though not necessarily as part of the semantic representation. Take a sentence like *Two men carry three suitcases.* In Landman's (1996) account, plural common nouns can shift their interpretation from sums to groups. Simplifying somewhat, assume that *three suitcases* here denotes a group of three suitcases, and that each man carries a different group. Then, even though the semantic representation of this sentence will not contain a set of groups of three suitcases, the model has to provide at least two sets of three suitcases. The suitcases in each set belong together

because they are carried by the same man. Thus, the defining aspect of these groups is provided by the sorting key *two men* (three suitcases per man).

At various points I have mentioned that the group readings can be paraphrased with *n X per Y* also, but that Y is not provided by an overt element in the sentence. Thus, for the group interpretations of the examples in (7), we might have three flowers per spot, three children per table, and three flowers per vase. Since Y is not provided by the sentence, it can vary according to context, and we might have three children per team rather than per table.

Thus, if we can analyze the group reading as a distributive relation between the NP containing *-nka* and a non-overt sorting key, we can say that the groups are defined by the aspect provided by this key. Furthermore, the groups associated with group readings would not have to be part of the semantic representation, but would be required to exist in the model in order to meet the truth conditions, just as with regular distributive relations.

So, to finally come to my proposal of how the group and kind readings associated with *-nka* may be derived, I suggest to adopt an analysis offered by Link (1998) to deal with marginal readings of the German distributive operator *je*. Link discusses the example in (14)

(14) **Je** drei Äpfel waren faul.
je three apples were rotten.

'Three apples per Y were rotten.'

Sentences like (14) are extremely rare, and not even widely accepted. They can certainly not be uttered out of the blue, but are only felicitous when the context clearly provides the referent for Y. One possible situation is an apple stand at a farmers' market, where three apples per basket were rotten.

To derive this interpretation, Link uses the same meaning representation for *je* as he does to derive regular distributive readings. In his account, the translation of a VP containing *je* is headed by a distributive operator, which relates the denotation of the sorting key to the denotation of the VP, containing the distributive share, such that all members of the key are in the denotation of the VP. Thus, in a sentence like *Die Kinder aẗen je drei Äpfel - The children ate three apples each*, the VP contains the distributive share *three apples* and the distributive operator *je*. This operator then relates the sorting key *the children* to the VP such that each of the children ate three apples. This is one of the standard ways of analyzing overt distributive operators.

In (14), *three apples* is the distributive share. Since no other plural NP is present that can serve as the sorting key, a plurality is provided externally by the context. In the example, this plurality is baskets. As mentioned, in regular distributive sentences, the sorting key and distributive share stand in the relation denoted by the verb to each other. In *The children ate three apples each*, the children and sets of three apples stand in the eating relation. When the sorting key is provided externally as in 14), the relation between the key and the share is of course not the one denoted by the verb, as the apples and baskets do not stand in a rotting relation. It is therefore necessary to enter a additional relation into the semantic representation of (14), which Link suggest to be *in*, so that we get the following paraphrase

for (14): There are groups of three apples, one group per basket, such that each group is in the basket, and the apples are rotten.

This analysis, I believe, can best account for the Quechua data presented in this paper. The difference between regular distributive readings on the one hand, and group or kind readings on the other comes down to the difference of providing one of the arguments of a distributive operator internally or externally. This is of course not specific to distributive operators. Quantificational operators in general can often be supplied with one of their arguments from the context. The technical details of this account remain to be worked out though, especially the matter of also supplying the right relation between key and share externally. Link himself does not explain how this is to be done, and in many of the Quechua cases discussed, the relation would have little semantic content. In the kind reading of (12), for example, the relation involved in interpreting three rolls of each kind would simply be *be*.

Besides this technical difficulty, the account has the following shortcoming for Quechua. As Link observes, (14) is perceived to be elliptical, and it can only be used if the context clearly provides a referent for the sorting key. In contrast, the group readings in (7) do not appear to be perceived as elliptical by consultants, despite the fact that they immediately imagine a suitable context that can provide the sorting key. In this respect, Quechua is more like Korean, for which Gil observed that an NP under the group reading is not felt to be elliptical and should be regarded as an independently referring expression. In my fieldwork, I found a clear contrast between group and kind readings in this respect. Kind readings strongly require the kinds to be present in the context, whereas group readings do not. This is however very impressionistic, and I have objective means of measuring how elliptical a certain construction feels to a native speaker. It is also not clear that all kinds of linguistic ellipsis have to be felt as such by the speakers. I do therefore not consider this to be a major disadvantage at this point. sIf it can be shown however that there are unwanted linguistic consequences of not having the NP to which *-nka* attaches be an independently referring expression, then we have to develop an analysis that does take this into account. For example, under this analysis we would not expect that an anaphor can refer back to the set of groups of cardinality n, but we would expect this to be possible in Gil's (and probably also in McKercher and Kim's (1999)) account. To settle this question, more data is needed, however.

This apparent shortcoming of ellipsis might also turn out to be a feature of the analysis. It predicts that the elided constituent can be expressed overtly. This appears to be the case. The group reading of a variant of (7a) can be brought to the fore by adding *sapa-nka qiru-man* as in (15.

(15) Irqi-kuna sapa-**nka** qiru-man kinsa t'ika-nka-(ta) chura-rqa-nku.
child-PL each-**nka** jar-DIR three flower-**nka**-ACC plant-PST-3PL.

(i) '(The/Some) children put three flowers in each jar.'

The advantages of supplying the sorting key externally are the following:

(i) *-nka* receives a uniform distributive semantics. The group and kind readings associated with it constitute a special and marked case. This captures the fact that *-nka* is not the standard means of expressing these readings.

(ii) Since no set of groups is introduced into the semantic representation, the stacking of numerals is not predicted

(iii) The sorting key also provides the aspect by which group membership is defined.

5 Conclusion and Future Work

In this paper I explored the meaning of Quechua *-nka*, which can occur in sentences with distributive interpretations, as well as in sentences with group and kind readings. Through comparison with Korean *-ssik*, which at first sight is similar to *-nka*, I have argued that the analyses proposed for *-ssik* cannot account for the Quechua data. I argued that *-nka* is a distributive marker, and that the group and kind readings are best derived as a variant of the distributive interpretation, in which the sorting key is supplied by the context rather than by an overt NP in the sentence. This analysis accounts for the fact that group and kind readings are not typically expressed by means of *-nka*, and that stacking of numerals is not possible.

I would like to conclude by situating *-nka* in the NP typology proposed by Gil (1987) and Gil (1990). Gil categorizes languages along a number of parameters relating to NP semantics, as shown in the following table. Type A languages, of which English is a representative, have count and mass nouns and configurational NPs. Type B languages have only mass nouns and non-configurational NPs. Korean and Japanese are examples for a type B language. The third column shows the values for Quechua.[15]

	Type A	Type B	Quechua
(a)	obligatory nominal plurality marking	optional	optional
(b)	optional numeral classification marking	obligatory	optional
(c)	obligatory definiteness marking	optional	optional
(d)	rigid NP-internal word order	free	rigid
(e)	absence of stacked numeral constructions	presence	absence
(f)	presence of hierarchic interpretations of stacked adjective constructions	absence	?
(g)	absence of adnominal distributive numerals	presence	presence

Gil (1990) suggests that this typology might help to answer the question of why some languages have adnominal distributive numerals - as combinations of a numeral + distributive marker such as *ssik/zutu* in Korean and Japanese are commonly referred to - and other

[15]The question mark in row (f) means that I do not yet have sufficient data available to me to determine whether or not stacked adjectives are interpreted hierarchically.

do not. In most of the examples presented in this paper, *-nka* is attached to the noun, not to the numeral, in a *n N* phrase. However, *-nka* can also attach to numerals directly as shown in (8a). Though this is not shown in any of the examples, *-nka* can also attach to the numeral in a *n N* phrase. Thus, Quechua does possess optional adnominal distributive numerals. As was shown in this paper, however, there are differences in behaviour between *ssik* and *-nka*, such as the (im)possibility of stacking numerals. Given that Quechua is a mixed type according to this typology, it is indeed expected that Quechua *-nka* should be different from both Korean *-ssik* and English *each*.

How exactly these typological parameters interact with the meaning of distributive and other quantificational operators in Quechua requires a lot more research. The analysis proposed here raises in particular the question why some distributive operators do allow one of their arguments to be supplied by the context, e.g. German *je* and Quechua *-nka*, and others such as English *each* do not.

The semantics of Quechua noun phrases in general has not been studied very much. For example, we do not yet know which elements are quantificational and which ones are not. Thus, I have assumed in this paper that numerals in Quechua are non-quantificational, but this requires further substantiation. One indication for this claim is the fact that sentences with two NPs containing numerals but no other quantifier and without *-nka* cannot be interpreted distributively. The distributive interpretation of such sentences in English is usually derived by establishing a scope relation between the two NPs. If Quechua numerals are more like intersective adjectives, and not inherently quantificational, they can in fact not participate in scope relations, which would explain the absence of the distributive reading.

I have in this paper not presented a formal analysis of *-nka*. As will be known to anyone familiar with the literature on distributivity, adopting a particular analysis immediately predicts a number of different readings (distributive, collective, cumulative etc.), and it is always a point of debate even for a language like English, how many readings a sentence has empirically. It is even harder to establish for Quechua the number of readings a sentence can have. I have already mentioned that certain readings predicted by scope mechanisms are not available in Quechua, and it is necessary to check whether readings resulting from other mechanism are possible or not. For example, in Landman's (1996) account, a set of readings is due to an operation that maps sums onto groups. It might turn out that this mechanism is also not used in the same in Quechua as it is in English.

It is also not possible to take an analysis of a distributive operator from the shelf and apply it directly to Quechua *-nka*. Even though I propose to analyze the group reading associated with it along the lines of Link's analysis of German *je*, it is not possible to directly adopt the semantics of *je* for *-nka*. For Link, the distributive operator is located in the VP, but *-nka* is a nominal suffix, which can also occur in the subject NP (cf. (2a)). It is therefore not immediately obvious how the composition would proceed if *-nka* is semantically a VP operator.

In summary, familiar ways of deriving readings for English sentences, might not or only partially be available for deriving readings in Quechua.

The formalization of the semantics proposed here for *-nka* and of distributivity in Quechua in general is therefore left for future work. Such an analysis would have to be embedded in a general framework of quantification and NP semantics in Quechua, and we have only recently begun to study these areas of Quechua linguistics.

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