

# NORTHERN KHANTY APPROXIMATIVE CONSTRUCTIONS IN PSEUDO-PARTITIVES

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**Abstract.** The aim of this article is to propose a formal semantic analysis of the approximative constructions in Northern Khanty (< Khantyic < Uralic). The data collected during three field trips is analyzed in the framework of Landman (2004), Rothstein (2017) and related works. Although several works (e.g., Winkler 2020) provide typological and comparative information on approximative constructions, a formal account is missing in the literature. The present paper sets out to fill this gap as well as provide a detailed report on pseudo-partitive constructions. I argue that the approximative marker in Northern Khanty is able to attach to numerals and units of measurement and its distribution forms a diagnostic of pseudo-partitivity. In such constructions, I associate different word orders to different syntactic structures and final truth conditions. This work strives to advance both formal semantics as applied to minority language and Khantyic (and even broader – Uralic) studies, providing new typological data.

**Keywords:** pseudo-partitive construction, approximative construction, formal semantics, Uralic languages, Northern Khanty.

## 1. INTRODUCTION

An approximative construction can be defined as a quantitative construction with an approximate or inaccurate quantitative value (such as ‘about ten thousand words’ or ‘around three working days’). This meaning can be encoded in a language in different ways: morphologically, lexically, syntactically, or pragmatically. In Northern Khanty, the primary language of the study, this meaning is mostly conveyed through an affix *-kem* (approximative, APPR).

Northern Khanty is an endangered Uralic language of the Khantyic branch spoken by the Ob’ river in the Yamal-Nenets and Khanty-Mansi Autonomous Regions of Russian Federation. According to Koshkareva (2016), the percentage of language proficiency decreased significantly from 1989 to 2010. Interviews with Kazym dialect speakers from Beloyarsky district show that only people born before the 1970s speak the language (Aristova 2023), while the younger generations generally do not.

The novelty of this work lies in a combination of collecting endangered language data and formal semantics. There are no such analyses of the above-mentioned construction in Northern Khanty. All existing descriptions, including those by M. E. Winkler on the approximative constructions in Uralic languages (e.g., Winkler 2020), are mostly interested in typological, comparative or syntactic perspectives.

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The general purpose and the expected outcome of the current study is developing a unified formal semantic approach for approximative constructions in Northern Khanty. In Section 2 the relevant literature is discussed. Section 3 is dedicated to utilized field methods and framework. In Section 4 Northern Khanty data is described and thoroughly examined, while in Section 5 my analysis of the present material is suggested. Section 6 concludes.

## 2. LITERATURE REVIEW

In this section I briefly examine the relevant literature. The review is divided into two parts: the first one is dedicated to typological and theoretical studies of pseudo-partitive and quantitative constructions, while the second one concerns the existing descriptions of corresponding Northern Khanty expressions.

### 2.1. Pseudo-partitive and quantitative constructions

According to Seržant (2021: 893), “[a] pseudo-partitive construction (abbreviated: a pseudo-partitive) is a partitive construction with no specific superset in the restrictor”. This type of expressions is divided into five groups corresponding to their measuring entity, as described in Matushansky *et al.* (2017: 1) with reference to Selkirk (1977): measures (‘five inches of rope’), containers (‘a glass of vodka’), portions (‘a slice of cheese’), atoms (‘a grain of gunpowder’) and groups (‘a gang of thieves’).

In this article I follow the distinction, based on Rothstein’s monograph (Rothstein 2017) and related works (e.g., Rothstein 2009). She classifies nouns in quantificational phrases (QPs) into two types, corresponding to their syntactic and semantic configurations: entities (counting) and units (measuring). Rothstein (2017: 3) explains this distinction thus: “Counting is putting individual entities in one-to-one correspondence with the natural numbers and this involves individuating the entities which are to be counted, while measuring involves assigning to a body (plurality or substance) an overall value on a dimensional scale which is calibrated in certain units”.

Importantly, Rothstein makes this distinction, based on the observation that “in a significant number of languages, from different typological families, counting cannot be reduced to measuring, nor can measuring be reduced to counting” (ibid.: 4). She argues that in English pseudo-partitive constructions this division is not encoded explicitly but can be discerned through context or via a set of tests. In Figure 1 below, the suggested syntactic structures for each of the readings are presented.

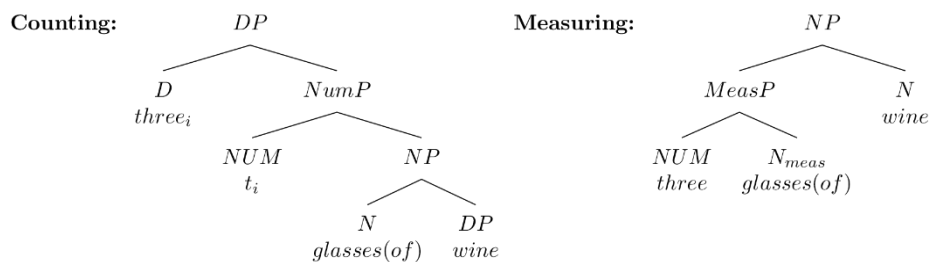


Figure 1.

*The syntactic structures proposed by Rothstein for two readings of English pseudo-partitive constructions (ibid.: 56–57): on the left – for a counting reading, on the right – for a measuring one.*

As was noted above, Rothstein proposes three diagnostics of measuring reading in Rothstein (2009). Two of them, the possibility of attaching a suffix corresponding to English *-ful* and compatibility with different types of relative clauses, are not applicable to the Northern Khanty data<sup>2</sup>. Third diagnostic includes distributive expressions, such as ‘each’ in English, which imply a counting reading. In addition, two complementary tests are proposed in Snyder and Barlew (2016): compatibility with degree nouns (e.g., ‘amount’ and ‘number’), following Scontras (2014), and slack regulators (for example, ‘approximately’ or ‘roughly’), so called in Lasersohn (1999). The authors claim that ‘amount’ and ‘approximately’ in English can only co-occur with measuring reading.

It is also important to mention several more studies based on Rothstein’s analysis, such as (Schvarcz 2017) about the suffix *-nyi* in Hungarian, (Borschev and Partee 2011; Partee and Borschev 2012) on the genitive of measure in Russian, as well as (Khrizman and Rothstein 2015) about the Russian approximative inversion. The Hungarian provides an important piece of evidence in support of the Snyder-Barlew diagnostics. According to Schvarcz (2017), *-nyi* is capable of both introducing a measuring reading (corresponding to the English suffix *-ful* in ‘hat\*(ful) of mushrooms’) and having an approximative interpretation in combination with units.

## 2.2. Previous Northern Khanty data

With one exception, the Northern Khanty approximative is poorly represented in the previous works. Its description is absent in any existing grammar of Khanty language, including Nikolaeva (1995), Nikolaeva (1999) and Kaksin (2010). The approximative marker is present in Koshkareva (2011), where it acts as a postposition with the meaning “approximately, almost, with” (p. 56), and in Solovar and Spiryakova (2000) as one way of “forming numerals of approximate counting” (p. 67). Strelkova (2013) refers to the latter work, citing *-kem* as an example of a “morphological way of expressing approximation” (p. 79). At the same time, the approximative marker is frequently used, as can be seen by its presence in dictionaries (e.g., Solovar 2014) and issues of the newspaper Khānty Jasāņ [Khanty Word].

It is important to mention M. E. Winkler’s master’s degree thesis (Winkler 2020) and related works (Sidorova 2017a; Sidorova 2017b) devoted to the approximative marker *-kem* in Northern Khanty and its analogues in other Uralic languages. These works are mostly concerned with typological and comparative semantic results (one exception is the joint syntactic work (Pleshak and Sidorova 2017) on the same topic based on Hill Mari and Moksha Mordvin materials). Although my data partially coincide with Winkler’s findings and to a certain extent confirm her generalizations, there are also significant differences, in particular, leading to different conclusions than those proposed in Winkler (2020). Either way, there is no formal semantic analysis of the Northern Khanty approximative constructions.

Pseudo-partitive constructions in Northern Khanty were studied by A. Soloveva (Soloveva 2019a). She noted the difference in readings depending on the word order and explored modification of these expressions. However, her research is presented only as a short field handout. Based on this, my data fill a gap in the literature about the Northern Khanty pseudo-partitives.

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<sup>2</sup> In Northern Khanty, there is no special marker similar to English *-ful*, as well as no difference in introducing relative clauses corresponding to English *which-* as opposed to *that-*clauses.

### 3. METHODS AND FRAMEWORK

This section is devoted to methods I utilized during two main stages of this research. Firstly, I will discuss fieldwork techniques and methodology that I have employed in the course of working with my consultants. Secondly, I will present the framework for my analysis.

#### 3.1. Fieldwork

In my research, I follow L. Matthewson's methodology of semantic fieldwork (Matthewson 2004). All the data come from fieldwork with native speakers of Northern Khanty, collected in the village of Kazym (Khanty-Mansi Autonomous Region-Yugra, Russia) during three field trips in Summer 2022, in Spring and Autumn 2023. In this research the judgments of totally eighteen consultants (twelve women and six men) are presented. Conclusions regarding the acceptability of each target sentence were drawn based on the estimation of at least five native speakers.

The above-mentioned data were obtained mostly through elicitation from Russian-language stimuli<sup>3</sup>: sentences accompanied with small contexts. My consultants were asked to simultaneously translate them in Northern Khanty (sometimes with their contexts as short stories to achieve greater spontaneity of language judgments). After that, I could pronounce the generated sentences in a slightly modified form (e.g., by adding or removing an affix and by changing the word order), requesting to evaluate their acceptability and to give them an interpretation, if possible. In addition, my consultants were sometimes asked to estimate Northern Khanty stimuli constructed by myself as well as taken from the existing corpora and dictionaries (see Solovar 2014).

#### 3.2. Semantic framework

The paper adopts an extended version of Heim and Kratzer's (1998) framework. It includes primitive types of entities ( $e$ ), truth values ( $t$ ) and numbers ( $n$ )<sup>4</sup>. Complex types are ordered pairs of both primitive and complex types. They correspond to functions which take an object of the first type and return an object of the second one. For example, any basic predicate of type  $\langle e, t \rangle$  takes an individual and returns a truth value: 1 – if taken entity is included in the extension of the predicate and 0 – if it is not.

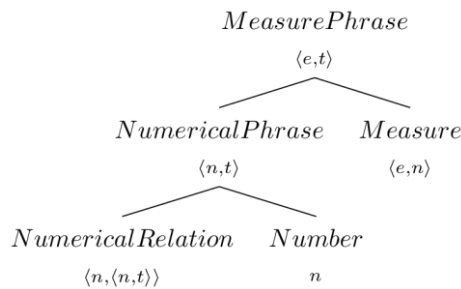


Figure 2.

*The compositional structure of quantitative constructions proposed by Landman (Landman 2004: 13–15).*

<sup>3</sup> All of my Northern Khanty consultants are sequential bilinguals with Russian acquired in school or shortly prior to school, so it serves as a meta-language in my studies.

<sup>4</sup> This stipulation is accepted following Landman (2004: 13). See Bylinina and Nouwen (2020) for an overview of different approaches to numerical semantics.

In Figure 2, NumericalRelation (NumRel) of type  $\langle n, nt \rangle$  is an expression that takes a number (type  $n$ ) and returns a function from numbers  $n$  to truth values  $t$ , which is equivalent to the relation between numbers (1 – if the numbers are in this relation, 0 – otherwise). Landman gives examples of such expressions, such as ‘at most’, ‘more than’, ‘exactly’, etc. Thus, ‘about’ in English, which represents the ratio of approximation between numbers, should also correspond to the NumericalRelation operator.

In addition to the standard Function Application (FA) (see Coppock and Champollion 2022: 212), which interprets the NumericalPhrase node (NumP) in Figure 2, Landman introduces a function composition (COMPOSE) (Landman 2004: 15). It gives an interpretation of the MeasurePhrase node (MeasP), taking the group of the numeral (NumP,  $(r(n))$ ) and the measure (Meas,  $M$ ) and returning their function according to the formula in (1). Landman also argues for the single structure for all quantitative constructions with the cardinality measure  $C$  (see (2), cited from Landman (2004: 14)) serving as a null measure.

- (1)  $\text{COMPOSE}[(r(n)), M] = (r(n)) \circ M = \lambda x. ([r(n)]([M(x)]))$
- (2)  $C = \lambda x. |x|$

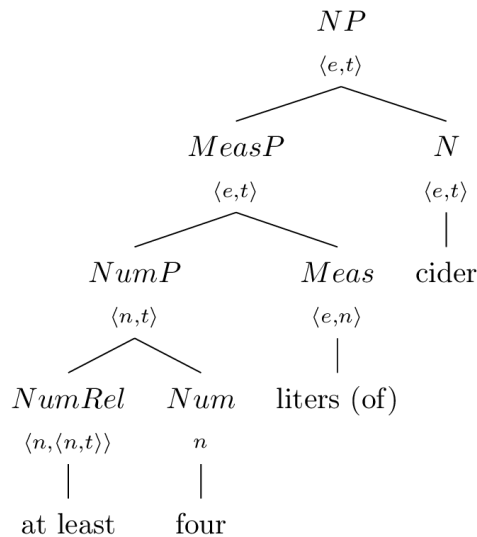


Figure 3.

*The compositional structure of quantitative constructions proposed by Landman (Landman 2004: 13–15), applied to ‘at least four liters of cider’ in English.*

The above-mentioned structure can be illustrated with the English construction ‘at least four liters of cider’. In Figure 3, NumRel of type  $\langle n, nt \rangle$  is an expression ‘at least’, introducing the ratio ‘ $\geq$ ’, and Num of type  $n$  is the number ‘four’. A measure of type  $\langle e, n \rangle$  is the  $\text{MEAS}_{\text{liter}}$  function from individuals to numbers, represented by the word ‘liter’, and NP of type  $\langle e, t \rangle$  is a standard function from individuals to truth values, represented by the word ‘cider’.

#### 4. NORTHERN KHANTY DATA

In this part, I will present several means of expressing approximation in Northern Khanty. Firstly, I will consider the basic strategy and the positional variability of the approximative marker, proposing an explanation in terms of the semantics of QPs. Secondly, I will discuss its compatibility with different types of numerals and parts of speech, as well as its use in other constructions besides quantitative ones.

##### 4.1. The basic strategy

In Northern Khanty, the marker *-kem*<sup>5</sup> expresses an approximation in most cases and is always able to modify both simple (e.g., (3)) and complex (see (4)) numerals within a QP. The latter ones are formed by combining simple ones (including *jaŋ* ‘ten’, *soŋ* ‘hundred’ and *šurəs* ‘thousand’ for tens, hundreds and thousands, respectively) (see Kaksin 2010: 87–88). The approximative marker can break this numerical group in the extremely limited set of cases: only if the first part is focused and the second one’s value is sufficiently large (cf., *jaŋ* ‘ten’ in (4) and *šurəs* ‘thousand’ in (5)).

- (3) pašaj-en **wet-kem**      χatλ-a      män-s  
 P.-POSS.2SG<sup>6</sup> five-APPR      day-DAT      leave-PST[3SG]  
 ‘Paul left for about five days.’
- (4) tām      kərt-ŋəλ-ən      kət-ən      \*χəλəm-kem      jaŋ      /  
 this      camp-DU-POSS.3DU      between-LOC      three-APPR      ten  
**χəλəm jaŋ-kem**      kilometra  
 three ten-APPR      kilometre  
 ‘There are about 30 kilometres between these camps.’
- (5) {– How many thousands of deer are there in a herd?}<sup>7</sup>  
 taš-ən      kāt      šurəs-kem /      kāt-kem      šurəs      wuλi  
 herd-LOC      two      thousand-APPR      two-APPR      thousand      deer  
 ‘There are about 2000 deer in the herd.’

As noted in Solovar and Spiryakova (2000), it is also possible to express inaccuracy “by combining two (less often three) numerals, while the numerals are arranged in ascending order” (p. 67). Several consultants necessarily attach the approximative marker to such constructions (see (6)). Thus, this observation may serve as an indicator that *-kem* is the default expression of inaccuracy in Northern Khanty (at least, for some of the speakers). However, this type of construction goes beyond the scope of this study since it is not grammaticalized and is not subjected to special limitations.

<sup>5</sup> In Northern Khanty, there are two approximative markers: *-kem* and *-lem*. The latter one has a narrower compatibility, since, based on my data, some of the consultants do not use it at all. For others, it can be combined with cardinal numerals from ‘1’ to ‘5’ (seldom ‘6’) only and there is no complementary distribution or semantic differences between *-kem* and *-lem*.

<sup>6</sup> In this article, the glosses are given in small caps and mostly correspond to the LGR (Leipzig Glossing Rules), except for ADD (additive particle), ADJ (adjectivizing suffix), APPR (approximative marker), ATT (attenuative clitic), NFIN (non-finite form), ORD (ordinal suffix) and PROP (proprietary suffix).

<sup>7</sup> The context of the stimuli is enclosed in curly brackets where relevant.

- (6) annaj-en χot ewəlt juχan wənta kăt χəλəm%(-kəm) kilometra  
 A.-POSS.2SG house from river to two three-APPR kilometre  
 ‘Ann’s house is 2-3 kilometres away from the river.’

#### 4.2. Different noun classes

In addition to the basic way of expressing inaccuracy (strategy (i.i) in Winkler (2020)), there is an alternative one in which the approximative marker is located after a noun in a QP (strategy (i.ii) according to Winkler (2020)). However, it is not available in all cases and not to all the consultants. Thus, some speakers have a “conservative system” that allows only the basic strategy of expressing inaccuracy: the approximative marker in the postposition to a numeral. The system of the other consultants is shown in examples (7–10).

- (7) annaj-en jǎŋ-kəm pušəχ / \*jǎŋ pušəχ-kəm λət-s  
 A.-POSS.2SG ten-APPR egg ten egg-APPR buy-PST[3SG]  
 ‘Ann bought about ten eggs.’
- (8) taś-ən sot-kəm wuli / \*sot wuli-kəm  
 herd-LOC hundred-APPR deer hundred deer-APPR  
 ‘There are about a hundred deer in the herd.’
- (9) pašaj-en wet śos-kəm / wet-kəm śos ul-s pa χul-a  
 P.-POSS.2SG five hour-APPR five-APPR hour sleep-PST[3SG] ADD fish-DAT  
 mǎn-s  
 go-PST[3SG]  
 ‘Paul slept for about five hours, and went fishing.’
- (10) wašaj-en χot-kəm puš / χot puš-kəm nórəm-a jǎŋχ-əs  
 B.-POSS.2SG six-APPR instance six instance-APPR tundra-DAT go-PST[3SG]  
 ‘Basil went to the tundra about six times.’

In sentences (7-8), attaching *-kəm* to a noun is impossible, while in (9–10) it is allowed. The main difference here lies in the semantics of nouns within a QP. On the one hand, *pušəχ* ‘egg’ and *wuli* ‘deer’ are entities according to Rothstein (2017) and disallow *-kəm* after themselves. On the other hand, words *śos* ‘hour’ and *puš* ‘instance’ are units under Rothstein’s analysis, therefore they permit the postposition of the approximative (on entities and units see Section 2.1.).

Special attention should be paid to example (11) (cf., (12)), where the acceptability depends not only on the unit reading of *kilometra* ‘kilometre’, but on several other parameters. Firstly, in Northern Khanty, the numeral *i* ‘one’ in measuring constructions is preferably omitted, arguably due to Grice’s Maxim of manner (Grice 1975). To speak of a distance of one kilometre, it is sufficient to say just ‘kilometre’, since such a phrase convey only that precise meaning and is the simplest (cf., the corresponding English translation in (11)). Secondly, the unacceptability of the combination *i-kəm* ‘one-APPR’ may be due to the fact that this form has lexicalized in the meaning of ‘the same’ (Solovar 2014: 71).

- (11) mašaj-en pa pašaj-en χot kət-ən \*i-kəm kilometrə /  
 M.-POSS.2SG ADD P.-POSS.2SG house between-LOC one-APPR kilometre  
 (i) kilometrə-kəm  
 one kilometre-APPR  
 ‘There is about a kilometre between Mary’s and Paul’s houses.’

### 4.3. Pseudo-partitives

Regarding example (11), it is also important to mention that the word *kilometrə* ‘kilometre’ may be considered a measure in sense of Matushansky *et al.* (2017) (see Section 2.1.). Other related examples (e.g., (12)) show that measures in Northern Khanty are located between a numeral and a measurand and can attach the approximative to themselves. The same applies to the occasional group units (e.g., (12)), where the word χot ‘house’ becomes a unit of the number of individuals (i.e., as many people as usually live in a house).

- (12) kat’aj-en lapkaj-ən (i) kilo-kəm kärtöpka λət-s  
 K.-POSS.2SG store-LOC one kilogram-APPR potato buy-PST[3SG]  
 ‘Kate bought about a kilogram of potatoes in the store.’  
 (13) χot-kəm jox λəw pila män-s-ət  
 house-APPR people 3SG with go-PST-3PL  
 ‘Almost all the residents of the house went with him {looking for his missing child}.’

However, when translating a pseudo-partitive construction with a container into Northern Khanty, both its preposition as in (14a) and postposition as in (14b) relative to a measurand are possible. Meanwhile, only in the former case, where the sequence of elements in a phrase corresponds to that in (12), one may attach the approximative marker to the container.

- (14) a. χəλəm-kəm kewan jɨk / χəλəm kewan-kəm jɨk sämi.lot  
 three-APPR bottle water three bottle-APPR water spring  
 ewəlt təw-a  
 from bring-IMP[SG]  
 b. χəλəm-kəm jɨk kewan / \*χəλəm jɨk kewan-kəm sämi.lot  
 three-APPR water bottle three water bottle-APPR spring  
 ewəlt təw-a  
 from bring-IMP[SG]  
 ‘Bring about three bottles of water from the spring.’

Let us consider the Snyder-Barlew tests (see Section 2.1. for the detailed discussion). Example (15) illustrates the possibility of combining units with a Northern Khanty degree noun *arat* ‘mass, multitude, amount’ (Solovar 2014: 25). In (16) it can be located after the container, but before the measurand. Such word order corresponds to one in (14a) and thus leads us to the preliminary conclusion of its true pseudo-partitive nature. The example of slack regulators in Northern Khanty is the approximative marker, which is able to attach to a container only in the case of its preposition relative to a measurand (cf., (14a) and (14b)).



- (15) *luw mǎn-əs wet kilametra arat-kem*<sup>8</sup>  
 3SG go-PST[3SG] five kilometre amount-APPR  
 ‘He walked about five kilometres.’ (Winkler 2020: 79 (137))
- (16) *aj nǎwrəm-t-a i χǎtλ-ən kewan (arat) ɛsəm.jiŋk*  
 little child-PL-DAT one day-LOC bottle amount milk  
*jańs-i mos-λ*  
 drink-NFIN.NPST must-NPST[3SG]  
 ‘Little children need to drink a bottle of milk a day.’

Based on the Snyder-Barlew tests, it can be argued that only (14a) is a true pseudo-partitive construction, since it permits the approximative modification on the unit and its word order corresponds to one that allows a degree noun insertion. This hypothesis is also confirmed by example (17), in which, unlike (16), the word order is similar to (14b), and ‘milk bottle’ clearly has a counting reading, and not a measuring one. Yet, Rothstein’s third diagnostic, concerning distributive expressions, also proved itself inapplicable to the Northern Khanty data. Even though it is impossible to combine *kašəŋ* ‘each’ and preposition of a container relative to a measurand as in (18a) (cf., the word order in (14a)), its postposition is also degraded. The only acceptable reinterpretation<sup>9</sup> of (17) is given in (18b) and does not involve counting word configuration as in (14b) and (17).

- (17) *mulχǎtəλ.mašaj-en ɛsəm.jiŋk(-i / -əŋ) kewan šukat-əs*  
 yesterdayM.-POSS.2SG milk-ADJ -PROP bottle break-PST[3SG]  
 ‘Yesterday Mary broke a milk bottle.’
- (18) a. *\*pet’aj-en kašəŋ nǎλ an jiŋk šaj.put-a pun-s-əλλe*  
 P.-POSS.2SG each four cup water teapot-DAT put-PST-3SG>SG  
 b. *pet’aj-en (%kašəŋ) nǎλ an ewəλt šaj.put-a jiŋk pun-s-əλλe*  
 P.-POSS.2SG each four cup from teapot-DAT water put-PST-3SG>SG  
 (Int. ‘Peter poured each of the four cups of water to the teapot.’)

The similar difference in readings, which depends on the word order, is also noted in other languages (e.g., Hill Mary data in Soloveva (2019b) and observations from Bashkir language in Say (2014)). It is worth noting that in constructions with the container postposition, in addition to combination of bare nouns, proprietive or adjectivizing suffixes *-əŋ* and *-i*, respectively, can be attached to a measurand (see (17)). This observation also implies that the latter configuration is a counting one and not a measuring one.

In conclusion, let us consider constructions with portions, atoms and unoccasional groups (cf., (12)), according to Matushansky *et al.* (2017) (see Section 2.1.). Based on the collected data, they have only one accessible counting interpretation and the corresponding postposition of an entity (see (19–21), respectively).

<sup>8</sup> The difference between *l* and *λ* in the context of this work is insignificant, since it is based only on the difference in traditions of writing the coronal lateral fricative. In addition, according to Winkler, *ɛ* and *e* are in complementary distribution, which entails the same entry for the lax and tense mid front unrounded vowels, respectively. Following Egorov (2019), I distinguish *ɛ* and *e* as contrastive.

<sup>9</sup> The best literal translation of (18b) from Northern Khanty would be ‘Peter poured water from each of the four cups to the teapot’. This reformulation may be accounted for in terms of the complexity of parsing.

- (19) *mʉŋ ɣot-ew-ən wet<sup>(OK-kem)</sup> ńań pul(\*-kem) / \*pul ńań*  
 1PL house-POSS.1PL-LOC five-APPR bread slice-APPR slice bread  
*ɣaś-əs*  
 left-PST[3SG]  
 ‘We have (about) 5 slices of bread left at home.’
- (20) *keši ewəlt ɣθləm<sup>(OK-kem)</sup> kǎli sɛm(\*-kem) / \*sɛm kǎli pit-s*  
 knife from three-APPR blood drop-APPR drop blood fall-PST[3SG]  
 ‘(About) three drops of blood fell from the knife.’
- (21) *jøš-ɛm-ən ńǎł<sup>(OK-kem)</sup> wułi taś(\*-kem) / \*taś wułi want-s-əm*  
 road-POSS.1SG-LOC four-APPR deer herd herd deer see-PST-1SG  
 ‘I saw (about) four herds of deer along the way.’

#### 4.4. Different types of numerals

In addition to cardinal numerals, I also checked the possibility of combining ordinals with the approximative marker. My consultants formed two unequal groups with respect to their judgements on this. For a smaller group, it is impossible to combine the approximative and ordinal suffixes on a numeral, and for the remaining majority sentence (22) is grammatical. It is worth noting that the configuration in example (22) is counting, since, based on the context, cars are objects that can be counted one by one. However, with a measuring reading, as in (23) (cf., (9) where the same noun is interpreted as a unit of time), the consultants for whom (22) was ungrammatical allowed to attach the approximative marker after the word *puś* ‘instance’. Based on this observation, I infer that it is not *-kem* itself which is sometimes unacceptable with ordinal numerals, but a sequence of two suffixes: *-mit* and *-kem*. It is also important to note that *klass* ‘grade/class’ in (24) was also interpreted by that smaller group of the consultants as a unit of time.

- (22) {Two guys are hitchhiking and have been standing on the road for several hours. When another car passes by them, one complains to the other;}  
*%tām wet-mit-kem mašinaj-en min muɣt-ɛmn-a mǎn-s*  
 this five-ORD-APPR car-POSS.2SG 2PL.DU by-POSS.1DU-DAT go-PST[3SG]  
 ‘This is about the fifth car that passes by us.’
- (23) *mašaj-en pašaj-en jasŋ-ət %ɣθt-mit-kem puś / %ɣθt-mit puś-kem*  
 M.-POSS.2SG P.-POSS.2SG word-PL three-ORD-APPR instance three-ORDinstance-APPR  
*ewəlt uša.wer-s-əλλe*  
 from know-PST-3SG>SG  
 ‘Mary understood Paul’s words after about the third time.’
- (24) *tām jasŋ-ət %ɣθl-mit-kem klass-ən / %ɣθl-mit klass-kem-ən*  
 this word-PL three-ORD-APPR grade-LOC three-ORD grade-APPR-LOC  
*wənłət-əl-i-t*  
 learn-NPST-PASS-3PL  
 ‘These words are learned in about the third grade.’

As for collective numerals, expressed in Northern Khanty using the word *ɣujat* ‘man’ with the locative suffix, the judgments of the speakers were split almost in half. So, for a bigger half of the consultants, example (25) seemed grammatical, while for the rest it was unacceptable.

- (25) %ńawrɛm-λ-an      **wet-kɛm**      **χujat-ən**      mǎn-s-ət      šøšilə-ti  
 child-PL-POSS.2SG      five-APPR      man-LOC      go-PST-3PL      walk-NFIN.NPST  
 ‘About five children went for a walk together.’

It is also worth mentioning two<sup>10</sup> further modifiers of QPs: with the words *šøp* ‘half’ (see (26)) and *mul̄tas* ‘remainder’ (e.g., (27)). They can stand in the same positions as *-kɛm*: either after a numeral or after a unit (cf., (27)). Interestingly, in both cases, the approximative seems to be attached “on top” of these words. This idea is partially reflected in Solovar and Spiryakova (2000: 68): “If a numeral is combined with the adjective *mul̄tas* ‘redundant’, then the affix *-kɛm* is attached to this adjective”. However, I also leave a more detailed discussion of these constructions for future studies.

- (26) pašaj-en      **oλ**      **šøp-kɛm**      mǎn-man      χøš      oλ-a      ji-s  
 P.-POSS.2SG      year      half-APPR      go-CVB      twenty      year-DAT      become-PST[3SG]  
 ‘About six months ago, Paul turned 20 years old.’
- (27) kasəm ewəlt wutwoš      wenta **λapət**      **šos**      **mul̄tas(-kɛm)** / **λapət mul̄tas(-kɛm)**  
 K.      from Y.      to      seven      hour      remainder-APPR      seven      remainder-APPR  
**šos**      χop-ən      mǎn-ti  
 hour      boat-LOC      go-NFIN.NPST  
 ‘It takes a little over seven hours to sail from Kazym to Yuilsk.’

#### 4.5. Outside a QP

The compatibility of the Northern Khanty approximative is limited to QPs, in contrast to, for example, ‘almost’ in English, which, as noted in Morzycki (2001: 307), “occurs in (the extended projections of) DP, VP, AP, PP, and AdvP”. In some idiolects, *-kɛm* can be combined with nouns in the meaning of ‘sized’. For example, sentence (28) was considered grammatical by only one of the consultants. However, it should be considered that in this sentence the noun *luwat* ‘magnitude, size’ is omitted and it is an equative construction (see below).

- (28) %λuŋ-əs      **pɛλŋa-kɛm**      χurasəp      wøj  
 enter-PST[3SG]      mosquito-APPR      similar      animal  
 ‘Something like a mosquito flew in (a mosquito-sized insect).’

As defined in Haspelmath (2017: 1), “[e]quative constructions express situations in which two referents have a gradable property to the same degree”. In Winkler (2020), with reference to Haspelmath and Buccholz (1998), it is noted that “in the languages of the world there are quantitative equatives (marking an equal amount) and qualitative equatives (marking the same degree of manifestation of a trait)” (p. 72). As was mentioned above, neither (28) nor its equivalent (29) can be consistently interpreted as a qualitative equative. At the same time, the absolute majority of consultants considered the sentence in (29) grammatical, where the approximative serves as a marker of a quantitative equative construction. Various nouns, all ending in *-at*, can act as a parameter (“some gradable property concept word” in Haspelmath (2017: 2)): *arat* ‘quantity’, *pālat* ‘height’, *wūtat* ‘width’, *kārśat* ‘height’, *luwat* ‘magnitude, size’, *kūlat* ‘thickness’, *mālat* ‘depth’ and *χūwat* ‘length’.

<sup>10</sup> As was noted in Belov (2024), there is also a less frequent word *wanpās* ‘approximately’, which denotes that something is nearly equal to a number but is slightly less and has the same features.

- (29) amp-en            **păsti.woj**    χurasəp / \*-**kəm**  
 dog-POSS.2SG    wolf            similar    -APPR  
 ‘The dog that looks like a wolf.’
- (30) tām            jux-en            **χot**            **kărsat(-kəm)**    wə-s  
 this            tree-POSS.2SG    house-APPR    height            be-PST[3SG]  
 ‘This tree was as tall as a house.’

Equative constructions can be easily reduced to approximative ones. At first glance, it seems that example (29) illustrates an accurate comparison, however, as noted in Winkler (2020: 82): “The exact comparison [...] is actually not accurate, but approximate”. Examples (15–16) illustrated the possibility of inserting *arat* ‘mass, multitude, amount’ into the quantitative construction. Therefore, it is possible to consider a unit in a QP as an analogue of a standard in equative construction (“the other referent to which the first referent is compared” as defined in Haspelmath (2017: 2)) with the omitted ‘arat’.

## 5. ANALYSIS OF NORTHERN KHANTY APPROXIMATIVES

Despite the fact that the semantics of both pseudo-partitive and approximative constructions have been studied quite well, most of these works’ ideas are not directly applicable to the Northern Khanty data. Rothstein’s analysis (Rothstein 2009; Rothstein 2017) does not imply an approximative structural modification. Thus, in Rothstein (2013) the operation APPROX is introduced, but it only shifts the semantics of lexical powers (e.g., ‘hundred’ and ‘thousand’) in constructions such as ‘hundreds of cats’. In Khrizman and Rothstein (2015), the approximative reading is set using word order, and it is suggested that “explicit approximators such as *about* introduce a shift from exact to approximative values, with different approximators constraining the relation of the range  $I_n^{11}$  to  $n$  in different ways” (p. 267).

On the other hand, the majority of formal semantic works on approximation are based on the English material (Lasersohn 1999; Morzycki 2001; Krifka 2002; Penka 2006) or data of other Germanic languages (Plank 2004; Krifka 2007). In these works, approximatives can combine not only with quantitative constructions, but also with verbs, adjectives and other parts of speech. Therefore, the implications of such analyses would lead to overgeneration of acceptable contexts in Northern Khanty, in which *-kəm* does not combine with similar types of phrases.

For these reasons, I take Landman’s structure as a basis (see Figure 2), which is a more complex version of Rothstein’s one, as noted in Borschev and Partee (2011: 117). I assume that *-kəm* is a NumericalRelation operator, but expresses the relation ‘ $\approx$ ’, defined in (31). In simple words, an approximative takes two numbers  $n$  and  $n'$  and returns the truth if and only if these numbers are nearly equal. The approximation ratio is formally defined in (32). Thus, two numbers  $n$  and  $n'$  are nearly equal if and only if there is an interval  $i$  from set of intervals  $I_n$  focused on  $n$ , and  $n'$ , in turn, belongs to the interval  $i$ .

<sup>11</sup> See the definition of  $I_n$  in (32).

$$(31) \quad \llbracket -kem \rrbracket_{\langle n, n \rangle} = \lambda n \lambda n'. n' \approx n$$

$$(32) \quad n' \approx n \Leftrightarrow \exists i \in I_n . n' \in i,$$

where  $I_n$  is a set of intervals focused on a number  $n$ ,  $i$  is an interval in  $I_n$ . A set of intervals  $I$  is focused<sup>12</sup> on a number  $n$  if and only if  $\forall i \in I, n \in i$  (Khrizman and Rothstein 2015: 267).

Figure 4 shows the structure of the Northern Khanty pseudo-partitive measuring construction  $\chi\theta\lambda\text{m}-kem \text{ kewan } jijk$  (three-APPR bottle water) ‘about three bottles of water’ (see (14)), in which the approximative is attached to the numeral, based on Landman’s analysis. In (33), a step-by-step derivation of its semantics is presented.

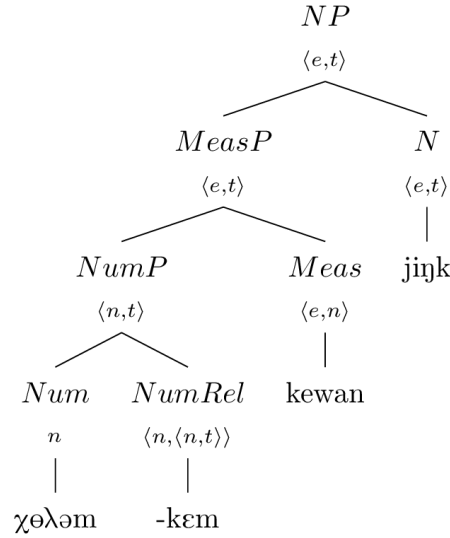


Figure 4.

*Application of Landman’s compositional structure to the Northern Khanty pseudo-partitive measuring construction  $\chi\theta\lambda\text{m}-kem \text{ kewan } jijk$  (three-APPR bottle water) ‘about three bottles of water’.*

$$(33) \quad \llbracket \chi\theta\lambda\text{m} \rrbracket = 3$$

$$\llbracket -kem \rrbracket = \lambda n \lambda n'. n' \approx n$$

$$\llbracket \text{NumP} \rrbracket = \llbracket -kem \rrbracket(\llbracket \chi\theta\lambda\text{m} \rrbracket) = [\lambda n \lambda n'. n' \approx n](3) = \lambda n'. n' \approx 3$$

$$\llbracket kewan \rrbracket = \lambda x. \text{MEAS}_{\text{bottle}}(x)$$

$$\llbracket \text{MeasP} \rrbracket = \text{COMPOSE}[\llbracket \text{NumP} \rrbracket, \llbracket kewan \rrbracket] = \lambda x. \text{MEAS}_{\text{bottle}}(x) \approx 3$$

$$\llbracket jijk \rrbracket = \lambda x. \text{water}(x)$$

$$\llbracket \text{NP} \rrbracket = \lambda x. \text{water}(x) \wedge \text{MEAS}_{\text{bottle}}(x) \approx 3^{13}$$

<sup>12</sup> This definition is not quite strict, since “focus” does not set the exact boundaries of the permissible distance from  $n$ . However, following Krifka (2002), I assume that such boundaries are set pragmatically according to the principle of precision level choice: “[w]hen expressing a measurement of an entity, choose a level of precision that is adequate for the purpose at hand” (p. 443).

<sup>13</sup> The meaning of NP is derived via the Predicate Modification (PM) rule as described, for example, in Coppock and Champollion (2022: 269).

The question arises how to interpret the structures of the type  $\chi\theta\lambda\theta m$  *kewan-kem jijk* (three bottle-APPR water) ‘about three bottles of water’, where the approximate marker follows the measure. At first glance, the present analysis is unable to take into account such phrases, since they combine objects of the types  $\langle e, n \rangle$  and  $\langle n, nt \rangle$ . The composition rules that I have resorted to so far are inapplicable here, so no interpretation can be assigned to these expressions. Note that if the approximative had already received its first numeric argument, then interpretation would succeed using the Function Composition, as in (33).

To achieve this result, I propose a solution using the Predicate Abstraction (PA) operation (see Coppock, Champollion 2022: 282) and introducing a null numeric pronoun  $n_i$  into the structure. Figure 5 illustrates the structure for  $\chi\theta\lambda\theta m$  *kewan-kem jijk* (three bottle-APPR water) ‘about three bottles of water’, and in (34) a semantic derivation is given.

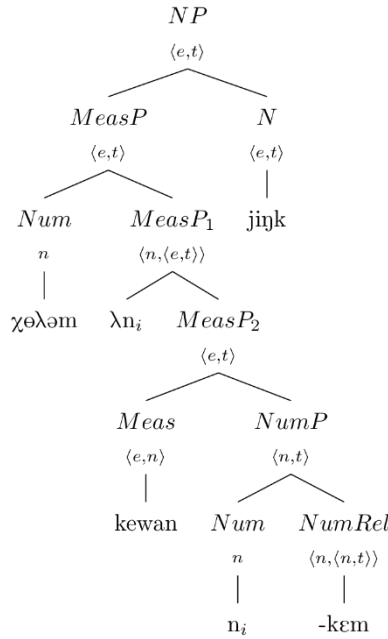


Figure 5.

*Application of Landman’s compositional structure to the Northern Khanty pseudo-partitive measuring construction  $\chi\theta\lambda\theta m$  *kewan-kem jijk* (three bottle-APPR water) ‘about three bottles of water’.*

- (34)  $\llbracket -kem \rrbracket = \lambda n \lambda n'. n' \approx n$   
 $\llbracket \text{NumP} \rrbracket = \llbracket -kem \rrbracket (\llbracket n_i \rrbracket) = [\lambda n \lambda n'. n' \approx n](n_i) = \lambda n'. n' \approx n_i$   
 $\llbracket kewan \rrbracket = \lambda x. \text{MEAS}_{\text{bottle}}(x)$   
 $\llbracket \text{MeasP}_2 \rrbracket = \text{COMPOSE}[\llbracket \text{NumP} \rrbracket, \llbracket kewan \rrbracket] = \lambda x. \text{MEAS}_{\text{bottle}}(x) \approx n_i$   
 $\llbracket \text{MeasP}_1 \rrbracket = \lambda n_i \lambda n'. \lambda x. \text{MEAS}_{\text{bottle}}(x) = n' \wedge n' \approx n_i = \lambda n_i \lambda x. \text{MEAS}_{\text{bottle}}(x) \approx n_i$   
 $\llbracket \chi\theta\lambda\theta m \rrbracket = 3$   
 $\llbracket \text{MeasP} \rrbracket = \llbracket \text{MeasP}_1 \rrbracket (\llbracket \chi\theta\lambda\theta m \rrbracket) = [\lambda n_i \lambda x. \text{MEAS}_{\text{bottle}}(x) \approx n_i](3) = \lambda x. \text{MEAS}_{\text{bottle}}(x) \approx 3$   
 $\llbracket jijk \rrbracket = \lambda x. \text{water}(x)$   
 $\llbracket \text{NP} \rrbracket = \lambda x. \text{water}(x) \wedge \text{MEAS}_{\text{bottle}}(x) \approx 3$

First, a null pronoun  $n_i$  combines with the approximative, which returns an object of type  $\langle n, t \rangle$ . Second, it composes with a measure, giving an object of type  $\langle e, t \rangle$ . Third, PA is applied, binding the variable  $n_i$  by a lambda operator and returning a function of the type  $\langle n, et \rangle$ . Lastly, the result is directly combined with the number ‘three’. Note that the final truth conditions, obtained as the result of this derivation of  $\chi\theta\lambda\text{ə}m$  *kewan-kem jijk* (three bottle-APPR water) ‘about three bottles of water’, are identical to the ones in (33).

Finally, I proceed to the counting construction  $\chi\theta\lambda\text{ə}m$ -*kem jijk kewan* (three-APPR water bottle) ‘about three water bottles’, which differs from the pseudo-partitive ones in terms of its word order and interpretation (here, the bottles are taken as entities, not units). Figure 6 shows the compositional structure, based on Landman’s analysis as well. Despite the fact that this construction has a counting reading (which arises from the interpretation of the noun *kewan* ‘bottle’ in the structure), I still assume the existence of a MeasP in which the measure is the null cardinality measure C (see (2)).

Following Snyder and Barlew (2016), I suggest that the measuring structure here is valid due to the presence of the approximative. As it stands, with a different analysis of the counting structure (e.g., the left tree according to Rothstein’s analysis in Figure 1) the insertion of *-kem* will lead to type mismatch and the derivation will collapse. Just as above, in (35) the semantic composition of the phrase is shown.

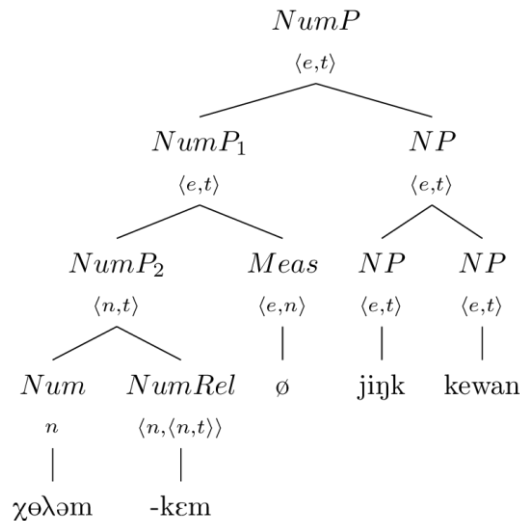


Figure 6.

Application of Landman’s compositional structure to the Northern Khanty counting construction  $\chi\theta\lambda\text{ə}m$ -*kem jijk kewan* (three-APPR water bottle) ‘about three water bottles’.

- (35)  $[[\chi\theta\lambda\text{ə}m]] = 3$   
 $[-kem] = \lambda n \lambda n'. n' \approx n$   
 $[[\text{NumP}_2]] = [[-kem]]([\chi\theta\lambda\text{ə}m]) = [\lambda n \lambda n'. n' \approx n](3) = \lambda n'. n' \approx 3$   
 $[[\text{Meas}]] = C = \lambda x. |x|$   
 $[[\text{NumP}_1]] = \text{COMPOSE}[[\text{NumP}_2], [[\text{Meas}]]] = \lambda x. ([\lambda n'. n' \approx 3])([\lambda y. |y|](x)) =$   
 $= \lambda x. ([\lambda n'. n' \approx 3])(|x|) = \lambda x. |x| \approx 3$

$\llbracket j\dot{i}n\dot{k} \rrbracket = \lambda x. \text{water}(x)$   
 $\llbracket k\dot{e}w\dot{a}n \rrbracket = \lambda x. \text{bottle}(x)$   
 $\llbracket \text{NP} \rrbracket = \lambda x. \text{water}(x) \wedge \text{bottle}(x)$   
 $\llbracket \text{NumP} \rrbracket = \lambda x. \text{water}(x) \wedge \text{bottle}(x) \wedge |x| \approx 3$

This analysis not only explains positional variability in measuring constructions, but also derives its impossibility in counting ones. The construction *\*χθλθm jīnk kewan-kem* (three water bottle-APPR) is uninterpretable due to the fact that *-kem* can be attached either to numerals (as in Figures 4 and 6) or to measures (see Figure 5) but not to common nouns. As can be seen from Figure 6, the word *kewan* ‘bottle’, having a counting interpretation, behaves like a noun. Therefore, it is unable to head the MeasP node in Figure 1 and to compose with the approximative.

The proposed semantic analysis explains the positional variability of the approximative marker *-kem*, but not its compatibility with ordinal numerals. Unlike cardinals, they are often analysed in degree semantics (e.g., Bylinina *et al.* 2015) since they “indicate the (relative) position in an ordered list” (Zabbal 2005: 4). Since such an interpretation implies a very strong departure from my current analysis, I reserve its adaptation and reinterpretation for future studies.

## 6. CONCLUSION

The present article was devoted to the approximative marker and its relation to pseudo-partitivity in Northern Khanty. First, I described my field data in terms of variability and distribution of the approximative marker and showed that it attaches to numerals and units only. Thereby, I showed that the preposition of a unit relative to measurand encodes a measuring reading in pseudo-partitive constructions (and its postposition – a counting one). Second, I proposed the model of semantic analysis, which is built on Landman’s compositional structure, covering Northern Khanty language material. Its augmentation with the PA operation allowed us to postulate identical final truth conditions for two measuring readings (the approximative follows a numeral or a unit) and differentiate them for counting and measuring ones.

I am convinced to have not only contributed new data about a minority language, but to also present an important connection between approximation and pseudo-partitivity as well as a new perspective on formal semantics of numerical phrases. For future studies, constructions with ordinal numbers and equatives and their cooccurrence with the approximative marker worth considering. This will definitely require modifying the current analysis (see Sections 4.4–5), and, as mentioned above, degree semantics may come in handy to achieve this goal. For a further development of this idea see Kozlova (2024).

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