Measure prefixes in Czech: cumulative *na-* and delimitative *po-*

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Table of contents:

0. Introduction

One of the most interesting areas of study of Slavic languages is the one connected to aspect, aspectual morphology, perfectivity, prefixes. The present thesis is concerned only with a small subpart of this large and complex area, namely quantificational prefixes in Czech. The main interest will be concentrated on two well known quantificational prefixes, namely delimitative *po-* and cumulative *na-*.

In Czech (as well as in other Slavic languages), prefixes can sometimes express quantificational meanings:

(1a)   Petr **na-**pekl koláče
        Petr na-baked cakes
        'Petr baked **a lot of** cakes'

(1b)   To   jsme   se   **na-**smáli!
        EMPH AUX.1pl   REFL na-laughed
        'Oh, we laughed **so much**!'

(1c)   Jakub o   tom   **po-**přemýšlel
        Jakub about it   po-thought
        'Jakub thought about it **for a little while**'

(1d)   Papoušek **po-**vy-lezl z krabičky
        parrot po-out-came out.of box
        'The parrot came out of the box **a bit**'

(1e)   Ester svou výpověď **po-**z-měnila
        Ester her testimony po-changed
        'Ester changed her testimony **a little**'

When one compares the sentences above with the ones below where the verbs are not prefixed by *po-* or *na-*[1] (or any other quantificational prefixes), it becomes clear that the quantificational meaning in (1a-e) comes from the prefixes.

(2a)   Petr u-pekl koláče

        Petr PfPr[2]-baked cakes

        'Petr baked cakes'

(2b)   Smáli jsme   se[3]

        laughed AUX.1.pl REFL

        'We laughed'

(2c)   Jakub o tom přemýšlel

        Jakub about it thought

        'Jakub thought about it'

(2d)   Papoušek vy-lezl z krabičky

        parrot out-came out.of box

        'The parrot came out of the box'

(2e)   Ester svou výpověď z-měnila

        Ester her testimony PfPr-changed

        'Ester changed her testimony'

The first generalization that comes to one's mind is that *na-* brings about modification in terms of contributing different notions of relatively large quantity, whereas *po-* has the opposite effect – it seems to contribute the notion of relatively small quantity.

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[1] In the following text, *po-* and *na-* stand for delimitative *po-* and cumulative *na-*. Of course, there are many other kinds of *po-* and *na-* apart from the *delimitative po-* and *cumulative na-*. In fact, most prefixes have multiple uses/meanings.

[2] PfPr – perfectivizing prefix.

[3] (2b) does not form a minimal pair with (1b). It is due to the fact that these constructions require certain emphasis to sound natural (see section 2.1.2.)

Later it will become clear, however, that even though *po-* and *na-* share the same basic meaning (just with opposite polarity), structurally, they are very different. They, in fact, apply to non-overlapping classes of things. This distinction leads e.g. to different consequences for the aspectual properties of the verbs prefixed by these two prefixes.

Generally, I believe that at least some morphosyntactic properties of different prefixed verbs (e.g. the possibility of secondary imperfectivization) and the rules governing their formation (e.g. possible combinations of prefixes and stems, stacking) can be explained in terms of their semantics – the semantics of the prefixes and the verbs themselves.

However, I am in no way claiming that there are no other factors at play. If that were true, there would be, for example, no reason for the diversity one can find even among closely related languages. Even apparently identical prefixes behave differently in different Slavic languages – they combine with different verbs/verb forms, they allow or disallow stacking etc. Some of the restrictions on formation of various prefixed verbs are probably purely syntactic (and language particular), there are many idiosyncrasies and so on.

Nevertheless, in my thesis, I am mainly concerned with the *systematic* properties of some prefixed verbs, moreover with the ones that could possibly be explained from the *semantics*.

I am not pretending I can offer a full account of the facts, though.

In chapter 1, I characterize cumulative *na-* and delimitative *po-* with respect to perfectivity, the lexical – superlexical distinction and quantification. Chapter 2 introduces and comments the data I focus on in this thesis; in chapter 3, the previous analysis of the same prefixes is summarized. Finally, in chapter 4, I present my own analysis. Chapter 5 provides a summary of the thesis.

1. Characterization of Czech quantificational prefixes

1.1. Prefixation and perfectivity

1.1.1. Perfectivity as a consequence of prefixation

Po- and *na-*, just like all[4] prefixes, make the verbs they attach to perfective.

Perfectivity is a morphological (morphosyntactic) notion rather than a semantic one (as e.g. telicity). There is generally no controversy in deciding whether a given verb is perfective or imperfective. There are several tests that unambiguously diagnose it:

(3)

	perf.	imperf.
1. future time reference in the present tense	+	-
2. compatibility with the future auxiliary	-	+
3. compatibility with phasal verbs	-	+

What is not a test for perfectivity, though, is the 'in an hour / for an hour' test. This is a diagnostic for telicity, which is not a notion co-extensive with perfectivity (see section 4.6.).

Although I am not going to demonstrate these tests in the following text, I assume them throughout.

1.1.2. Lexical and superlexical prefixes

Po- and *na-* arguably belong to a subclass of prefixes, called superlexical prefixes (as opposed to lexical prefixes).

The distinction between lexical and superlexical prefixes can be specified as follows:

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[4] The only potential counterexample I can think of is Filip's (2004) *po-nocovat* 'stay up late', which is imperfective (and not a secondary imperfective). However, it seems that *po-nocovat* is not derived *po-* + *nocovat*. There is an old Czech word *ponocný* 'night watchman', denoting someone who walks in the night – *po noci* (*v noci* in contemporary Czech). My guess is that *ponocovat* has the same origin – i.e. it is derived rather from the PP *po noci* than from *nocovat*.

Lexical prefixes (or 'qualifying' in Isačenko's terminology) are the ones that create a new lexical item, to which it is possible to form a secondary imperfective. *Superlexical* (or 'modifying') prefixes result in various types of Aktionsart.[5] These verbs, then, lack the second member of the aspectual pair (they are perfectiva (or imperfectiva) tanta) (Isačenko, 1982).

Smith (1997) defines lexical prefixes as the ones that convey lexical meaning, apart from perfectivizing the verb. Superlexical prefixes "present a narrow focus of a situation, usually on the endpoint or middle" (p.242). She mentions that these prefixes are called 'Aktionsart', 'sublexical', 'mode of action' or 'procedural' in the Slavic literature.

According to Babko-Malaya (1999), lexical prefixes attach to a lexical head, whereas superlexical ones are adjoined to a functional category. Superlexical prefixes "correspond to aspectual words or adverbial phrases in English and other languages" (p.76).

Some possible tests that can serve as diagnostics of superlexical prefixes are these (summarized in Babko-Malaya (1999) and Eugenia Romanova's class presentation handout, Tromsø, spring 2003):

Superlexical prefixes:
1) have regular meaning (as opposed to lexical prefixes that allow for idiosyncrasies)
2) do not allow secondary imperfectivization
3) measure over events or arguments
4) can stack on top of lexical prefixes
5) attach to imperfective or non-directed stems

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[5] Filip (1999) summarizes what has been said about Aktionsart in Slavic linguistics:
"'Aktionsart' includes notions related to measure, phase, degrees of intensity, as well as such quantificational notions as 'distributivity'" (p. 194).

Po- and *na-* are generally taken to be prime examples of superlexical prefixes. Nevertheless, not all instances of *po-* and *na-* conform to the above characteristics (cf. chapter 2). Especially *po-* is not "well behaved" in this respect.

I will not go into commenting on this – either on the relevance of the lexical – superlexical distinction – in the present thesis.[6] In what follows, I will look in detail essentially only at point 3) of the list above.

1.2. <u>Quantifier class: lexical A-quantifiers</u>

Semantically, quantificational prefixes like delimitative *po-* and cumulative *na-*, but also e.g. distributive *po-*[7], are A-quantifiers, in the sense of the distinction between A- and D-quantifiers (Partee, 1995).

A-quantifiers are called *A*-quantifiers since they form syntactic constituents with verbal rather than nominal projections; *A* stands for "the cluster of Adverbs, Auxiliaries, Affixes, and Argument-structure Adjusters" (p.544) (*D* stands for Determiner). In fact, A-quantifiers are not a homogeneous class and can be further divided into

"(i) true A-quantification, with unselective quantifiers and a syntactic (or topic/focus […]) basis for determining, insofar as it is determinate, what is being quantified over, and (ii) lexical quantification, where an operator with some quantificational force (and perhaps further content as well) is applied directly to a verb or other predicate at a lexical level, with (potentially) morphological, syntactic, and semantic effects on the argument structure of the predicate" (p.559).

Prefixes like *po-* and *na-* clearly belong to the class of *lexical* quantifiers. What is particularly interesting is that, although these prefixes only attach to verbs, they may and actually must quantify over nominal expressions in some cases.

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[6] I discussed the validity of the lexical – superlexical distinction in Součková (2003).

[7] In fact, surprisingly many prefixes have some kind of quantificational meaning among their possible meanings/uses, e.g.: *pod-*, *pře-*, *pro-*, *vy-*, *za-*, *u-*....

As e.g. Filip (2000) points out, Slavic languages are not unique in having quantificational prefixes, i.e. lexical A-quantifiers. In fact, the similarities with e.g. some Australian languages are striking (cf. e.g. Warlpiri and its preverbal quantifiers like *puta*- etc., Partee, 1995; or other languages, Evans, 1995 etc.).

2. Data

2.1. *na-*

There are two main classes of verbs prefixed by cumulative *na-*: transitive *na-*verbs (2.1.1.) and reflexive *na-*verbs (2.1.2.). Within the class of transitive *na-*verbs, or, rather, within the constructions containing transitive *na-*verbs, there is another interesting subclass of cases, which will be treated in a separate section (2.1.3.), since verbs in this class seem to behave exceptionally.[8]

2.1.1. 'Transitive' *na-*verbs (*na-*verbs with the underlying object)

These *na-*verbs are derived from imperfective transitive or unaccusative verbs and are themselves either transitive or unaccusative.[9]

Na- quantifies always and only over the direct object argument. Since *na-* means roughly 'a lot', the resulting interpretation is 'to V a lot of O'. From this, it follows that the DP in the direct object position must be either plural or mass.

(4a)   Petr sem na-nosil   židle   / nábytek / vodu
         Petr here na-carried chairs / furniture / water
         'Petr brought a lot of chairs / furniture / water here'

(4b)   Babička na-trhala květiny
         grandma na-picked flowers
         'Grandma picked a lot of flowers'

(4c)   Jakub na-stříhal hvězdičky z barevného papíru
         Jakub na-cut little.stars out.of colored paper
         'Jakub cut a lot of stars out of a sheet of colored paper'

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[8] Not all generalizations I will make about the class of transitive *na-*verbs do extend to the exceptional class.

[9] For the sake of simplicity, I will call all these verbs *transitive* most of the time, although, strictly speaking, it would be more appropriate to call them *verbs with underlying objects*.

In none of the sentences can the direct object be a singular count noun, nor can its cardinality be lower than some contextually given number. It may be better to say that *na-* means 'not few / little' or that the amount is 'sufficient' than to say that it means 'a lot',[10] since the following examples are out without any doubt only when the cardinality is one or two; *three* is sometimes much better and it is hard to say whether *four* is bad at all even in contexts where four is not that much (e.g. in na-pick flowers):

(5a)   Petr sem na-nosil *židli / *dvě židle / ??tři židle / ?čtyři židle
        Petr here na-carried *1 chair / *2 chairs / ??3 chairs / ?4 chairs
        'Petr brought (a lot of) *1 chair / *2 chairs / ??3 chairs / ?4 chairs here'

(5b)   Babička na-trhala *květinu / *dvě květiny / ?čtyři květiny
        grandma na-picked *1 flower / *2 flowers / ?4 flowers
        'Grandma picked (a lot of) *1 flower / *2 flowers / ?4 flowers'

(5c)   Jakub na-stříhal *hvězdičku / ??tři hvězdičky z barevného papíru
        Jakub na-cut   *1star   / ??3 stars   out.of colored paper
        'Jakub cut (a lot of) *1star / ??3 stars out of a sheet of colored paper'

One of the reasons why the word *transitive* is in quotes[11] in the section title is that there are also unaccusative *na-*verbs, which I consider to be the same in the relevant respect. That means that the verbal argument originates in the direct object position, just like the direct object of transitive verbs, and this is what matters here. Some of the relevant examples are:

(6a)   Jablka / *jablko na-padala/*-o pod strom
        apples / *apple na-fell.pl/*.sg under tree
        'A lot of apples / *(a lot of) an apple fell under the tree'

(6b)   Kluci / *kluk na-skákali / *-l do auta

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[10] For the sake of simplicity, I will however continue to translate *na-* as 'a lot'.

[11] The other reason is that, in fact, all *na-*verbs are transitive, as I will try to show later on.

9

boys / *boy na-jumped.pl/*.sg into car

'A lot of boys / *(a lot of) a boy jumped into the car'

As for unergatives, the *na*-verb constructions are simply ungrammatical:[12]

(7a)   *Kluci na-pracovali

       *boys na-worked

       intended: 'A lot of boys worked'

(7b)   *Děti na-zpívaly

       *children na-sang

       intended: 'Many children sang'

2.1.2. Reflexive *na*-verbs

2.1.2.1. *na*- quantifies over the reflexive

The other, and much more productive, class of *na*-verbs are those that take the accusative reflexive *se* obligatorily. Reflexive *na*-verbs[13] can be derived potentially from all verbs, i.e. both from those that can and from those that cannot form transitive *na*-verbs.

For some *na*-prefixed verbs, we have both the transitive and the reflexive construction:

(8a)   Na-nosil   jsem   prkna

       na-carried AUX.1sg.m planks.ACC

       'I brought a lot of planks'

(8b)   To   jsem   se   na-nosil   prken![14]

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[12] I take this to be one of the few available tests for unaccusativity in Czech.

[13] I call these *reflexive* na-*verbs* as if the *na*-verbs themselves were different from the transitive *na*-verbs. What is really different is rather the meaning of this type of construction – which is caused by the obligatory presence of the reflexive.

[14] The reflexive *na*-verbs usually only sound good when pronounced with emphasis. Hence the emphatic elements like *to*, *ale*, *něco* etc. in the example sentences. I do not know why this is so.

EMPH AUX.1.sg   REFL na-carried.masc planks.GEN

'What a lot of planks I have brought!'

(8c)   Na-trhal   jsem   jahody

na-picked.masc AUX.1.sg strawberries.ACC

'I picked a lot of strawberries'

(8d)   To   jsem   se ale   na-trhal jahod!

EMPH AUX.1.sg REFL EMPH   na-picked strawberries.GEN

'What a lot of strawberries I have picked!'

(8e)   Na-chodil   stovky kilometrů

na-walked.masc hundreds km

'He has walked hundreds of kilometers'

(8f)   To   jsem   se ale na-chodil!

EMPH AUX.1.sg REFL EMPH na-walked

'How much I have walked!'

The original object is demoted from the structural accusative case position to the (structural) genitive case position (sometimes it could be omitted).

Here are some examples of the reflexive *na*-verbs that can never occur in transitive (nor unaccusative) constructions:

(9a)   Hrozně se s tím na-trápil

terribly REFL with us na-had.a.hard.time

'He struggled with it a lot'

(9b)   Za ta léta jsme   se ale na-tančili!

Since this emphasis is not required or even preferred in the case of 'transitive' *na*-verbs, I am inclined to assign it to the construction as a whole or to the interaction of *na*- with the reflexive (i.e. I do not take this to be a sufficient reason to treat the occurrences of *na*- in both kinds of constructions as two distinct prefixes).

in those years AUX.1.pl REFL EMPH na-danced

'We danced a lot in those years!'

Filip (2000) characterizes the contribution of *na-* in the reflexive *na*-verb constructions, apart from conveying the quantificational meaning, as follows:

> "Closely related to the quantificational and measurement meanings are strong affective connotations. For example, ***na- adds satiation*** ('to one's heart content', 'to tire oneself with V-ing'), high intensity ('to perform V in a protracted, uninterrupted, persistent, intensive manner') […]"

(p.48, emphasis mine)

The 'satiation' is really present in these constructions. The construction means 'enjoy V sufficiently' or 'undergo V to such an extent that one feels satisfied'. However, I claim that this satiation comes rather from the reflexive (or the combination of the prefix and the reflexive) than from the prefix itself. I will get to this in more detail in the next subsection.

2.1.2.2. *na- + se* ⟹ **satiation**

When one looks at the examples (8b, d, f and 9a, b) above, it might not be obvious, but I claim that the amount of V-ing is large or sufficient not because this much V-ing is generally large for a given context but rather because the person experiencing it thinks so.

This can be seen from the following example. One can say:

(10a)   Na to, jak   je znám,   se   smály[15] dost…

for that how them know.1.sg.PRES REFL laughed enough

'Considering their normal behavior, they laughed enough…'

and continue like this:

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[15] *Smát se* is a reflexive verb.

(10b)   …ale ještě se evidentně ne-**na**-smály dost

         …but yet REFL obviously NEG-na-laughed enough

         '… but they obviously still didn't have enough laughing'

but not like this:

(10c)   #…ale ještě se evidentně ne-smály dost

         #…but yet REFL obviously NEG-laughed enough

         # '…but they obviously still didn't laugh enough'

This seems to show that there is a difference between perceiving something as sufficient by the experiencer/subject of the activity and understanding something as sufficient viewing from outside; and that *na*-verbs choose the first interpretation.

Since, as I have just argued, the activity undergone by the subject is considered sufficient on the basis of the subject's perceiving the activity as sufficient, it is not surprising that only animate subjects are available for these *na*-verbs:

(11a)   Lenka se   už na-ležela dost, je načase, aby začala něco dělat

         Lenka REFL already na-lay enough, is time, so-that started something do

         'Lenka has spent enough time lying around, it is time for her to do something'

(11b)   U toho okna   jsem se   něco na-stál, když jsem   tě

         at the window AUX.1.sg REFL EMPH na-stood, when AUX.1.sg you

         vyhlížel

         watched-for

         'How much time I spent standing at the window when I was watching for you!'

vs.

(12a)   ??Ten drát se   na zemi   na-ležel dost dlouho, než ho
           ??the wire REFL on ground na-lay enough long-time before it
           někdo zvedl
           somebody picked-up
           '??The wire spent a lot of time lying on the ground before somebody
           picked it up'

(12b)   ??Ten dům se   tu ale   něco na-stál, a teď ho během pár
           ??the house REFL here EMPH EMPH na-stood, and now it during few
           minut zbourali
           minutes pulled-down
           '??The house spent so much time standing here, and now they have
           pulled it down in few minutes'

(12c)   Ten drát ležel na zemi dost dlouho,   než ho někdo zvedl
           the wire lay on ground enough long-time before it somebody picked-up
           'The wire lay on the ground for a long time before somebody picked it
           up'

(12d)   Ten dům tu   stál tak dlouho, a teď ho během pár minut zbourali
           the house here stood so long, and now it during few minutes pulled-
           down
           'The house stood here so long, and now they have pulled it down in few
           minutes'

The sentences in (12a-b) are funny, since the only way in which to interpret them
is that *drát* in (12a) and *dům* in (12b) are living creatures with their own
perception and emotions. The sentences without *na-* (12c-d) are completely
normal.

14

2.1.2.3. *se* is in the direct object position

Although the class of reflexive *na*-verbs might look very different from the class of 'transitive' *na*-verbs, I believe that the difference is, actually, not that deep. I might not be able to provide the full account of the facts but I still believe it is a possible and, in fact, desirable thing to do.

To be explicit about what I mean – I argue that the verbs under 2.1.2 are, in a sense, transitive[16] as well - namely that it is *se* that occupies the direct object position and that *na*- quantifies over this very same position here again. The special interpretation these constructions get is the result of this quantification over the reflexive.

However, the demonstration that these verbs are fulfilling the same pattern is not going to be that simple and straightforward.

First of all, *se* is probably not a DP, at least not a proper one. It has some nominal properties, though. Namely, case, or, to be more accurate, a case form. *Se* is an accusative form, as opposed to *si*, which is dative.

The claim that *se* is not a DP in this case (although it may be in other cases) can be demonstrated by the traditional substitution test – when *se* is pronominal, it can be substituted by the full form of the pronoun like in:

(13)   vidět **se** v zrcadle – vidět **sebe** v zrcadle[17]
         (see REFL in mirror – see REFL in mirror)

In *na-plakat se* (na-cry REFL), *na-chodit se* (na-walk REFL), *na-nosit se vody* (na-carry REFL water.GEN), this is completely out:

(14)   *na-plakat sebe, *na-chodit sebe, *na-nosit sebe vody

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[16] Or, maybe it is more precise to say that the prefix is transitive.

[17] Similarly for the dative reflexive clitic: *blahopřál **si** k úspěchu – blahopřál **sobě** k úspěchu*.

The claim that *se* is not a regular DP here is supported by the interpretation these sentences get. If it were a real/full DP, the expected result would be quantification over the subject because the coindexation of *se* with its antecedent, the subject of a sentence. But this is obviously not true. The sentence

(15a)   Ti chlapci se ale   na-běhali!
         the boys REFL EMPH na-ran

does not mean that a lot of boys did some running. In fact, it means that some boys did a lot of running (or it was perceived as *a lot* of running). If *na-* quantified over the subject (via the reflexive), we would expect singular DPs to be impossible in the subject position, which is not the case:

(15b)   OK: Pavel se ale na-běhal!
         Pavel REFL EMPH na-ran
         'Pavel did a lot of running'

So, the conclusion is that *se* is probably not a DP but it occupies an argument position, namely the direct object position, the position where the structural accusative case is assigned.

But what about the interpretation of such sentences? How does it arise?

Na- quantifying over *se*, in other words 'a lot of *se*', means a lot of experiencing the relevant activity. How exactly this works, is a mystery for me.

I do not want to come up with any kind of ad hoc solution. First, a better understanding of reflexives in general, and Slavic in particular, would be needed. Only then could one try to describe what is going on here.

2.1.3. <u>Transitive *na*-verbs with singular count objects</u>

Although I claimed (in 2.1.1.) that *na-* requires the DP it quantifies over to be plural or mass, there *are*, in fact, transitive *na*-verbs taking singular count DPs as objects.

A similar example - with the distributive prefix *po-*[18] – is to be found in Filip (1999); more distributive *po-* examples (in Polish) are discussed by Piňón (2003).

The relevant data are:

(16)   na-lámat tužku (na kousky), na-stříhat papír (na proužky),
          na-break pencil (into pieces), na-cut paper (into strips),

          na-štípat poleno (na třísky)
          na-chop log (into kindling)

These verbs occur in alternations like the following ones:

(17)   nastříhat čtverečky (z listu papíru) – nastříhat list papíru (na čtverečky)
          na-cut small.squares (from sheet of paper) – na-cut sheet of paper (into small.squares)

          naštípat třísky (z polene) – naštípat poleno (na třísky)
          na-chop kindling (out.of log) – na-chop log (into kindling)

What leads me to the claim that it is the same *na-* what is at play here, is, besides the existence of the alternation itself, the fact that one has to break the pencil more

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[18] (i)   Dášeňka mi po-rozžvýkala tkaničku od boty
          Dášeňka me DISTR-chew.PAST lace from shoe
          Dášenka gradually chewed up my whole shoe-lace

"[i] with a singular count Incremental Theme noun phrase is acceptable, because every successive subevent corresponds to a different subpart of the shoe-lace that was chewed up by the dog named Dášenka" (Filip, 1999, p.265)).

Distributive *po-* is like cumulative *na-* in many respects: it has quantificational meaning and superlexical behavior; it targets (only) DPs in the (underlying) direct object position (and hence can be, just like *na-*, used as a test for unaccusativity: if an intransitive verb is prefixed by distributive *po-*, than it is unaccusative); there is the possibility of the direct object being singular – with the same effect; there are some more similarities, which I cannot go into here. Comparison of distributive *po-* and cumulative *na-* would deserve a separate paper; discussing it here would go beyond the scope of the present thesis.

than once (and better more than twice, too) if one wants to use the verb *na-lámat*. Otherwise, *roz-lomit* or *pře-lomit*[19] would be used.

Similarly, with the other verbs – there are different prefixes available for describing a single event of V-ing. This is visible on the resultative phrase:

(18)   **na-**lámat tužku na kousky / *na dva kousky
       na-break pencil into pieces / *2 pieces

       na-stříhat papír na proužky / *na dva proužky
       na-cut paper into strips   / *2 strips

       na-štípat poleno na třísky/ *na dvě třísky
       na-chop log into kindling / *2 pieces of kindling

vs.

(19)   **pře-**lomit tužku na dva kusy
       PfPr-break pencil into 2 pieces

       roz-střihnout papír na dva pruhy
       PfPr-cut   paper into 2 strips

       roz-štípnout poleno na dva kusy
       PfPr-chop   log into 2 pieces

At first glance, this type of construction seems to pose a problem for the generalization about the behavior of *na-*. The direct object is (countable and) singular and, moreover, *na-* seems to be quantifying over the DP in the resultative prepositional phrase, in other words, over a DP in a completely different syntactic position.

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[19] Note the different stem. Cf. Romanova (2004).

I argue, though, that even in this case, *na-* indeed *does* quantify over the object in the accusative case, despite the fact that it is singular, and that there is no direct relation between the prefix and the prepositional phrase.

I claim that in the sentence

(20)   Jakub na-lámal tužku na kousky
         Jakub na-broke pencil into pieces
         'Jakub broke the pencil into pieces'

na- does quantify over the direct object *tužku* – but, since the direct object is singular, the interpretation cannot be that of the cases in 2.1.1. So, the sentence gets the only interpretation available in this context – the 'iterative' or 'multiple' one, that of an iterated act of breaking the same pencil several times. The derivation does not crash, as in **na-péct housku* (na-bake roll), exactly because there is the possibility of understanding the event as a multiple action, which is not available for baking rolls, since one can bake the same roll only once[20].

It may be important to stress that the physical object denoted by the direct object of the *na*-verb has to be the same[21] in all the sub-events of the multiple event and that we interpret the multiple event as one event and not more events.

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[20] The same pattern emerges with plural objects: *na-lámat tužky*.PL *na kousky* has the iterative meaning ('break several pencils into many pieces'), whereas *na-péct housky*.PL can only mean 'bake many rolls'. *Na-lámat tužky*.PL (*na kousky*) can in fact have *only* the iterative meaning; if *na-lámat tužky* had a possible non-iterative meaning, it would have to be something like 'create many pencils by breaking sth'.

The following example is particularly interesting because both readings – the iterative and non-iterative – are available when the object is plural.

If we consider *natrhat květiny*.PL vs. *natrhat květinu*.SG (*na kousky*), we can see that whereas the most natural reading for *natrhat květiny*.PL is 'pick a lot of flowers', *natrhat květinu*.SG can only mean 'tear a flower (into many pieces)'. However, if we add the 'into many pieces' PP to *natrhat květiny*.PL: *natrhat květiny na kousky* ('tear some flowers into many pieces'), it becomes obvious that the iterative reading is possible here, too.

[21] In fact, it cannot be the same object after it is affected by breaking, cutting etc. But this is not a language fact, it is about the real world knowledge.

The reason why the DP in the prepositional phrase cannot be of cardinality two (or one) does not mean that *na-* quantifies directly over it. It rather follows from the fact that if you break/cut something more than once, you cannot end up with just two pieces. It is only an indirect reflection of the effect *na-* has on the interpretation of the sentence (via quantifying over its object).

This explanation is supported by the fact that the resultative prepositional phrase is only optionally present, while the direct object is always obligatory with *na-*verbs.

2.1.4. <u>Morphosyntactic properties of *na-*verbs</u>[22]

<u>stacking</u> (diagnostic 4 for the superlexical status of prefixes, p.6)

Cumulative *na-* does not stack easily, while some other superlexical prefixes do. In fact, there are some cases of stacking but they are quite rare:

(21)   Co   on se na-vy-mýšlel blbostí!

           EMPH he REFL na-invented nonsense

           'What a lot of nonsense he made up!'

<u>secondary imperfectivization</u> (diagnostic 2, p.6)

Verbs prefixed by cumulative *na-* are perfective, just like all prefixed verbs. They do not form secondary imperfectives.

(22a)   (na-trhat květiny, na-nosit židle, na-sbírat houby, …

          na-pick flowers, na-bring chairs, na-pick mushroom,…)

SI: *natrhávat[23] květiny, *nanosívat/*nanášel židle, *nasbírávat houby,…

(22b)   (nasmát se, nachodit se, naplakat se, …

          na-laugh REFL, na-walk REFL, na-cry REFL, …)

---

[22] Some of the properties described here and in 2.2.5. are mentioned just for the sake of completeness – I am not going to offer an explanation for everything about *po-* and *na-*verbs. Nevertheless, I find it important to include the discussion of these morphosyntactic properties because I believe they are often explainable in terms of the semantics of the prefixes.

[23] *Natrhávat* is a good SI, but the one derived from *natrhnout*, not from *natrhat*. As for the other SIs, they are simply ungrammatical.

SI: *nasmávat se, *nachodívat se, *naplakávat se, …

transitivity

As for the transitive *na*-verbs, the direct object is in general obligatory, whether it is the case for the base verbs, too, or not:

(23)   trhat *(tulipány) → natrhat *(tulipány)

          pick tulips.ACC

          sbírat *(houby) → nasbírat *(houby)

          pick mushroom.ACC

          krást (milióny) → nakrást *(milióny)

          steal millions.ACC

Nevertheless, there are counterexamples to this generalization, since one can easily say:

(24)   Maminka zase na-pekla / na-vařila

          mum again na-baked / na-cooked

It is, however, hard to come up with more examples.

As for the *na*-verbs that take the reflexive, these are, under my analysis, necessarily transitive in all cases – if we take *se* to occupy the direct object position. What is more interesting, though, is the fact that even the demoted original object, now genitive, is often obligatory:

(25)   sbírat houby – nasbírat houby – *nasbírat se *(hub)*

                              na-pick REFL mushroom.GEN

          nosit židle – nanosit židle – *nanosit se *(židlí)*

                              na-bring REFL chairs.GEN

          štípat dříví – naštípat dříví – *naštípat se *(dříví)*

                              na-chop REFL wood.GEN

21

Still, there are some cases, just as with the 'transitive' *na*-verbs, when the genitive object is not obligatory since it is somehow understood:

(26)   Co   se   naše babička za život na-pekla / na-vařila / na-kradla!
        EMPH REFL our grandma in life na-baked /na-cooked / na-stole

As for the genitive case on the object, I would say it is a structural case, since it is not typical for a particular verb but rather for a particular construction. If we take the view that the direct object is demoted from the accusative case position, since the reflexive takes up the position for itself, and if the object never gets any other case, it is reasonably to assume that the genitive case is not assigned by virtue of any special properties of a given verb but rather by virtue of the object being in a given position in the tree.

reflexives

Here, I only summarize what has been said so far:

In one of the two classes of constructions with *na*-verbs, the accusative reflexive (*se*) presumably occupies the direct object position. The behavior of the reflexive is completely regular in the sense that it is always present (in this kind of construction) and it gives rise to the same interpretation in each case. This regular and systematic behavior of *se* with *na*-verbs is in contrast with much more peculiar behavior of *si* with *po*-verbs (see section 2.2.5.).

There is, however, one interesting detail:

When deriving a reflexive *na*-verb from a base verb that takes the dative reflexive (obligatorily), the dative reflexive is not present in the resulting construction:

(27a)   (Stěžoval   **si** mamince)
        complained REFL mum.DAT

        Co on **(*si) se (*si)** na-stěžoval svojí mamince!
        EMPH he REFL na-complained his mum

(27b)   (Hrál   **si**   s dětmi)

22

played REFL with children

Co on **(*si) se (*si)** s těmi dětmi nahrál!
EMPH he REFL with the children na-played

There is a general ban on the sequence *si se (and *se si), i.e. there is no possibility to use two reflexive clitics in a row, although it is all right to have more than one clitic in a sequence in general. Since there is no other way to avoid the forbidden sequence, *si* is simply omitted or maybe rather fused with *se*.

2.2. *po-*

Cases of verbs prefixed by delimitative *po-* mentioned in the literature usually represent only a subset of all possible cases. This is caused either by the fact that this subset of *po*-verbs constitutes the most salient class, or by the fact that the other classes are not taken to be instances of the same prefix. However, this is the reason why *po-* is, in my opinion, often misinterpreted as meaning 'for a short while', instead taking it to mean simply 'a little'. Once a larger set of *po*-verbs is considered, it should become more obvious what *po-* really is and what it does.

2.2.1. 'Short time' *po*-verbs

This is the best known (and sometimes the only mentioned) class of *po*-verbs. These verbs are derived by attaching *po-* to an imperfective verb (stem). They get the interpretation 'do something for a short while':

(28a)   Jakub o tom po-přemýšlel
         Jakub about it po-thought
         'Jakub thought about it for a little while'

(28b)   Přišel, po-klábosil s námi a za chvíli zase odešel
         came, po-chatted with us and after while again left
         'He came, chatted with us for a while and, after a while, he left again'

That *po*-V really means 'V for a *short* time' can be seen from the incompatibility of such verbs with temporal adverbials that suggest longer duration:

23

(29a)   Jakub o tom   chvilku / trochu / ??dlouho / ??hodně po-přemýšlel

Jakub about it for while / a bit / ??for a long time / ??a lot po-thought

'Jakub thought about it (for a while) for a short while / a bit / ??for a long

time / ??a lot'

(29b)   ??Celý den s námi po-klábosil

??whole day with us po-chatted

'??He sat with us (for a while) the whole afternoon'

The facts are often complicated by the (often obligatory) presence of the dative reflexive *si*.[24] The reflexive has the benefactive meaning here, so, the resulting interpretation is approximately 'do something for a short while, something that gives you pleasure or satisfaction':

(30a)   Babička si   při nejdojemnějších scénách po-plakala

grandma REFL at most-touching scenes po-cried

'Our grandma cried a bit, while watching the most touching scenes (she

enjoyed it)'

(30b)   Péťa si   po obědě chvilku po-spal.

Péťa REFL after lunch for a while po-slept

'Péťa had (and enjoyed) a short nap after lunch'

Since many of the *po*-verbs require *si* to be well-formed, *po-* is sometimes misinterpreted as containing the benefactive meaning itself. As we can see from the examples without *si*, this is not the case. The sentences in (28) and (29) are absolutely neutral with respect to the pleasure the described activities might bring to the people undergoing them.

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[24] For which I have no good explanation (see 2.2.5).

2.2.2. 'Short distance' *po*-verbs

2.2.2.1. *po*- quantifies over distance

This class of *po*-verbs consists of verbs of directed motion or transfer. They get a uniform interpretation, namely 'move (something) a short distance'.

In this class of verbs, *po*- attaches either to a perfective or to an imperfective verb. Let us look at the base verbs first.

In some Slavic languages, there is an interesting opposition within verbs of motion, namely the opposition directed – non-directed (cf. Isačenko, 1982). Both kinds of verbs are imperfective, but the directed ones denote motion in one direction whereas the non-directed ones suggest the motion could be in all possible directions, e.g. back and forth.

(31)

directed (IMPF.)	non-directed (IMPF.)
jít	*chodit*
'go'	
jet	*jezdit*
'drive'	
letět	*létat*
'fly'	
nést	*nosit*
'carry'	
vézt	*vozit*
'drive sb/sth'	
táhnout	*tahat*
'drag'	
etc.	

As for the verbs that have the directed – non-directed opposition, 'short distance' *po*-verbs are only derived from the verbs in the first column.[25] As for verbs that

---

[25] Note that this is not expected if *po*- is a superlexical prefix here (cf. diagnostic 5, p.6)

lack this opposition, there is still the requirement that there is some notion of direction present in their semantic representation. I.e. they could be either verbs prefixed by directional prefixes (*vy-jet* out-drive, *vy-lézt* out-crawl, *ode-jít* from-go) or semelfactives (like *skočit* 'jump (once)') – which can only denote motion in one direction because they happen in one instant, hence, there is no time, so to speak, to change the direction.

Other motion verbs than the directed ones may take delimitative *po-*, too, but they do not get the relevant interpretation (*po-chodit* belongs to the first class and means 'walk for a short while', not 'walk a short distance').

So, finally, let us look at some examples of 'short distance' *po*-verbs:

(32a)   Řidič trochu po-po-[26]jel, aby nám nestál v cestě
         driver a bit po-po-drove so-that us not-stood in way
         'The driver moved on a bit so that he didn't stand in our way'

(32b)   Jakub úlekem po-od-skočil.
         Jakub fright.INSTR po-from-jumped
         'Jakub jumped (once) a bit away, as he got frightened'

(32c)   Lucie po-vy-táhla   dopis z obálky
         Lucie po-from-pulled letter from envelope
         'Lucie pulled out the letter from the envelope a bit'

Here, again, observe the incompatibility with adverbials suggesting longer movements:

(33a)   Lucie maličko / ??hodně / *úplně   po-vy-táhla   dopis
         Lucie a little bit / ??a lot / *completely po-from-pulled.P letter
         z obálky
         from envelope

---

[26] This second *po-* is rather mysterious. I discuss it in the following subsection.

'Lucie pulled out the letter from the envelope (a bit) a little bit / ??a lot / *completely'

(33b)   Řidič po-po-jel 2m / ??300 km / *přes celé parkoviště.
          driver po-po-drove.P 2m / ??300km / *across the whole parking lot
          'The driver drove (a bit) 2m / ??300km / *across the whole parking lot'

2.2.2.2. *po-po-*

What about the double *po-*? Let us look at it in some detail.

Po-po-jít, for example, means 'to move (go) a bit in some direction'. There is no verb **pojít*[27], however; the only form of the infinitive is *jít*.

This second *po-* is not peculiar to 'short distance *po*-verbs'. I suppose it is the same *po-* that is used in forming imperatives and future tense of some verbs of movement (the most basic ones):

(34)

infinitive	*jít*	*jet*	*letět*	*lézt*
	'to go'	'to drive'	'to fly'	'to crawl'
	(**pojít*)	(**pojet*)	(**poletět*)	(**polézt*)
imperative	**po**jď	**po**jeď	**po**leť	**po**lez
future	**pů**jde[28]	**po**jede	**po**letí	**po**leze

For imperatives, it is also possible to get the following forms:

(35)   *jdi*   *jeď*   *leť*   *lez*

The difference between the two possibilities resembles the difference between English '*come*' (for the *po*-variants) and '*go*' (for the non-prefixed variants). The *po*-variants somehow involve the speaker – they either mean that the motion

---

[27] Actually, there is, but it means 'to die' – when talking about animals.

[28] *Pů-* is just a morphophonological variant of *po* – '*ů*' [u:] is historically derived from the long '*o*' [o:]

should be performed in the speaker's direction (*pojď ke mně* = come to me) or together with the speaker (*pojď se mnou* = come with me).

It looks as though the second *po-* (actually the first one attached) has the function of making a stem perfective (or look perfective) – then the whole class of 'short distance *po-*verbs' would be homogeneous. The idea seems to be supported by the fact that the future tense forms of verbs like *jít, letět, jet, lézt* are not formed periphrastically as expected with imperfective verbs (*budu jít, *budu letět, *budu jet...).[29] Instead, a prefixed present tense form is used for future reference (*půjdu, poletím, pojedu*...),[30] which is reminiscent of forming the future with perfective verbs (using a present tense form – non-prefixed, however). Thus, *po-*prefixed verbs of movement may appear to be perfective – more precisely, their future forms only.

These future tense *po-*verbs do not have perfective meaning, though, which can be seen from the translation of the following example where *po-letím* has the progressive meaning, i.e. flying and wearing the new dress is simultaneous:

(36)   Až   po-letím   domů,   budu   mít na sobě ty nové šaty
         when po-fly[I].1.sg.FUT home, AUX.1.sg have on self the new dress
         'When (=while) I fly home I'll be wearing the new dress'

whereas in:

(37)   Až   při-letím   domů,   budu   mít na sobě ty nové šaty
         when to-fly[P].1.sg.FUT.[31] home, AUX.1.sg have on self the new dress
         'When (=after) I get home (by flying) I'll be wearing the new dress'

flying precedes wearing the new dress.

---

[29] Some verbs have both possibilities: *pocestuju – budu cestovat* (I will travel), *povedu – budu vést* (I will lead) etc.

[30] These are actually the only real future tense forms in Czech, since here the future is marked, it is not just a present form - compare *nesu*.1sg.PRES 'I carry/am carrying' vs. *ponesu*.1sg.FUT 'I will carry' (cf. Kopečný, 1962).

[31] In fact, the form of the verb is a present tense form (with future reference).

So, it is perhaps safer to say that, as for 'short distance' *po*-verbs, delimitative *po*-attaches either to a perfective *or* to a directed imperfective stem.

2.2.3. **'Low degree' *po*-verbs**

There are some change-of-state verbs that combine with *po*-, though they are not so many. These are either intransitives or causatives (they entail change of state of the direct object). The derived meaning is 'to change (sth) a little / to a low degree'.

(38a)   Tulipány po-vadly

        tulips po-withered

        'The tulips withered a bit'

(38b)   Žeňa po-smutněla

        Žeňa po-got-sad

        'Žeňa got sad a bit'

(38c)   Babička během nemoci po-hubla[32]

        grandma during sickness po-lost-weight

        'Our grandma lost some weight while she was sick'

Here are some transitives:

(39a)   Patrycja text trochu po-změnila, než nám ho poslala

        Patrycja text a bit po-changed before us it sent

        'Patrycja changed the text slightly before she sent it to us'

(39b)   Maminka po-opravila   záclonu na okně   a narovnala

        Mum po-corrected/adjusted curtain on window and straightened

---

[32] The meaning 'a little' is easier to see in comparison with the same verbs prefixed by purely perfectivizing prefixes: *z-vadnout* (wither^P), *ze-smutnět* (grow sad^P), *z-hubnout* (get thin^P). These do not suggest that the change was only slight.

dečku

tablecloth

'Mum adjusted the window curtain a bit and straightened the tablecloth'

Again, the preceding sentences sound good when an adverbial like *trochu* 'a bit' is added and strange when something like *hodně* 'a lot', *do velké míry* 'to a large degree' modifies the verb phrases. Other / more specific adverbials are hard to insert in this case.

2.2.4. 'Low intensity' *po*-verbs

I mention this class of verbs only for the sake of completeness. It is unclear how these verbs are derived. They do not seem to be secondary imperfectives derived from prefixed (perfective) verbs[33] but they neither seem to be derived by prefixation from habitual imperfectives.[34] The most intuitively plausible (but otherwise problematic) solution is that these verbs are derived by circumfixation, i.e. by the simultaneous prefixation and suffixation.

The interpretation of sentences containing these verbs is possible to describe like this: 'do sth a little / with low intensity from time to time / occasionally / with interruptions':

(40a)   Petr celé odpoledne po-kašlával

---

[33] Which is the claim in Jabłońska (2004).

[34] I discussed the mysterious derivation of the attenuative frequentatives in Součková (2003). I argued there that these verbs are not secondary imperfectives derived from the 'short while' *po*-verbs because they do not mean 'be doing something for a while' (the progressive reading) nor 'do something for a while habitually' (the habitual reading) but rather 'do something with low intensity now and then/occasionally'. Such a meaning shift is not expected under secondary imperfectivization.

Another reason for rejecting the secondary imperfectives analysis is that the presumable perfective bases are often non-existent.

The other possibility, i.e. the one of deriving the attenuative frequentatives by prefixation from habitual imperfectives is unlikely as well because the attenuative frequentatives are imperfective – and I know of no counterexamples to the generalization that prefixation leads to perfectivization. Moreover, again, some 'low intensity' *po*-verbs lack the unprefixed counterparts.

Petr whole afternoon po-cough[I]

'Petr coughed a little from time to time for the whole afternoon'

(40b)   Na stole po-blikávala lampa

on table po-flickered[I] lamp

'There was a lamp on the table, flickering intermittently'

(40c)   Naše babička pořád po-stonává

our grandma all the time po-is-ailing[I]

'Our grandma is constantly sick a bit (with improvements and deteriorations)'

Due to the problems with determining what the right derivation of these verbs is, it is hard to see the scopal relationships among the prefix, the imperfectivizing suffix and the root – it is difficult to show that the semantics follows from the morphology.

Nevertheless, I am convinced that the prefix these verbs contain is the same *po-* as in the previous three classes of verbs and conveys the same meaning ('a little'). The specific interpretation ('do sth a bit / with low intensity from time to time') must come from the interaction with the imperfectivizing suffix.

2.2.5. Morphosyntactic properties of *po*-verbs

stacking

As for the 'short time' *po-*verbs, *po-* never stacks. The only potential candidate for stacking I can think of is *po-pře-mýšlet*.

However, I think that *přemýšlet* should not be analyzed as *pře-* + *mýšlet*, although historically, it is probably how the verb was formed (pře- + myslit, 'think over'). *Přemýšlet* is an imperfective verb. This would be a problem if we took *přemýšlet* to be a prefixed verb.

Moreover, the form of the stem is not entirely expected. If we look at other verbs that are derived by prefixation of *myslet*, their stem is the same in both the prefixed and the unprefixed form:

(41)   base verb   prefixed verb (perf.)   (secondary imperf.

myslet   →   odmyslet si   → odmýšlet si

disregard / leave sth out of consideration

→   vymyslet   → vymýšlet

invent / make up

→   zamyslet se   → zamýšlet se)

stop and think / give a thought to

So, perhaps, *přemýšlet* is, in a diachronic sense, a SI from **přemysli/et*. However, **přemysli/et* does not exist in contemporary Czech anymore; hence, *přemýšlet* was reanalyzed as an underived verb.

The 'short distance' and 'low degree' *po*-verbs do allow stacking:

(42)   po-od/-vy-skočit, po-ode-jít, po-u-smát se, po-z-měnit, po-o-pravit

po-from/-out-jump, po-from-go, po-smile REFL, po-change, po-correct

secondary imperfectivization
Verbs prefixed by delimitative *po-* are perfective.
As for the possibility of the secondary imperfectivization, the *po*-verbs do not behave uniformly. Some of them do form secondary imperfectives, some of them do not. The ones that do form secondary imperfectives – quite regularly – are the 'short distance' *po*-verbs:

(43a)   secondary impf.

po-po-jít   po-po-cházet   (po-po-go)

po-vy-skočit   po-vy-skakovat   (po-out-jump)

po-vy-táhnout   po-vy-tahovat   (po-out-pull)

Some of the 'low degree' po-verbs form SIs, too:

(43b)   po-z-měnit   po-z-měňovat   (po-change)

| | po-o-pravit | po-o-pravovat[35] | (po-correct) |

Others do not:

| (43c) | po-blednout | *po-bledávat | (po-get-pale) |
| | po-hubnout | *po-hubávat | (po-lose-weight) |

'Short time' po-verbs never form SIs:

(43d)	po-číst si	*po-čítávat si	(po-read REFL)
	po-přemýšlet	*po-přemyšlovat	(po-think)
	po-klábosit	*po-klábosívat	(po-chat)

The generalization might be that the verbs that were prefixed/perfective already before *po-* was attached to them generally do form SIs. Those verbs that were unprefixed/imperfective do not.

It would probably make sense since one could say that the delimitative prefix itself does not have rich enough semantics to license secondary imperfectivization. When there is another prefix present in a *po*-verb, it looks as though this other prefix licenses the SI, since it presumably provides the richer semantic content.

However, there are some problems with this generalization.

First, we would have to assume that the dummy *po-* in cases like *popojet* or *popoletět* really makes the verb (the input for the delimitative prefix) perfective. Which might and might not be true (see section 2.2.2.2.).

Second: some of the prefixes *po-* stacks on top of are also void of content – they are purely perfectivizing in some cases (*po-z-měnit*; *měnit* change – *z-měnit* – (SI:) **z-měňovat*; *z-* is a purely perfectivizing prefix here, hence no SIs derived from *změnit*).

Third, there is, in fact, one example of a *po*-verb derived from an imperfective (unprefixed) verb that allows secondary imperfectivization:

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[35] Some of these verbs are ambiguous between the delimitative and distributive reading, e.g. *po-vy-skakovat*, *po-vy-tahovat*, *po-o-pravovat* etc.

(44)   po-vadnout   po-vadat   (po-wither)

Nevertheless, however problematic the connection between non-stacking and the impossibility of SI is, it is an interesting coincidence that in the case of *na*-verbs, these two properties cooccur, too (see section 2.1.5.)

transitivity

Po-verbs are mostly intransitives – at least the 'short time' *po*-verbs. Among them, it is hard to find good transitive examples. One such case is *povařit* (po-cook). Other examples could be e.g. *pojíst* (po-eat), *popít* (po-drink); these are however exceptional in many respects.

First, the presence of a direct object is not obligatory with these verbs.

Second, they do not seem to have a completely compositional semantics – they seem to be rather lexicalized, with other than purely quantificational meanings present.

Third, there are forms that could be said to be their SIs (*popíjet, pojídat*) – these have, however even more idiosyncratic semantics than their perfective 'counterparts'. *Popíjet* could perhaps be said to be an attenuative frequentative verb (see 2.2.4.); the same is much harder to conclude about *pojídat*, which is much closer to a simple imperfective verb *jíst* (eat) in its meaning.

As for the other two classes of *po*-verbs, they are both divided into a transitive and intransitive subclass. The transitive subclass of 'short distance' *po*-verbs are the verbs of transfer (*po-po-nést* po-po-carry, *po-po-vézt* po-po-drive, *po-vy-táhnout* po-out-pull/drag). 'Low degree' *po*-verbs contain a transitive subclass, too, namely causatives entailing a change of state of the object (*po-z-měnit* po-change, *po-o-pravit* po-correct).

The generalization is that *po-* ignores objects. There should be no requirement as for the transitivity of the input verbs.

The interpretation of *po*-verbs is the same regardless of the presence of an object. In the case of 'short time' *po*-verbs, the clear tendency towards intransitivity should perhaps be explained. My intuition about transitive *po*-verbs is that *po-*

easily gets a resultative interpretation there. For some reason the 'short distance' and 'low degree' *po*-verbs escape the resultative interpretation easier.

<u>reflexives</u>

The most intriguing fact about the morphosyntax of verbs prefixed by delimitative *po*- is that many (but not all) 'short time' *po*-verbs take the dative reflexive *si* obligatorily:

(45)   číst (si) → po-číst *(si)   (po-read REFL)

          plakat (?si) → po-plakat *(si)   (po-cry REFL)

          kouřit (?si) → po-kouřit *(si)   (po-smoke REFL)

The last two examples are actually a bit strange with *si* when unprefixed; however, the benefactive dative is in principle freely available for potentially all kinds of verbs. The fact that *si* may become obligatory when the verbs are prefixed constitutes a real puzzle. So far, I have no explanation for the fact.

In traditional grammars, *poplakat si* and similar combinations of a verb and a reflexive are usually considered a single lexical item. There is no separate *poplakat* and *po*- plus *si* seem to form a unit conveying the meaning that the activity was short but pleasant.

Nevertheless, there are short time *po*-verbs that do not require *si* − some of them actually sound better without it:

(46)   po-přemýšlet (o něčem)   (po-think about sth)

          po-chodit   (po-walk)

          po-hovořit (o něčem)   (po-talk about sth)

          po-vařit (něco)   (po-cook sth)

There might be an interesting connection between the obligatoriness of *si* and compositionality. Some *po*-verbs seem to deviate to a bigger or smaller extent

from compositionality – they seem to be on their way towards lexicalization.[36] *Po-být* (po-be, 'stay (somewhere)') might be an example of a verb where the (compositional) quantificational meaning is almost lost. Some other verbs have apparently partly undergone the same process. These could be e.g. the following verbs:

(47)   po-pít (po-drink), po-jíst (po-eat), po-sedět (po-sit), po-stát (po-stand)

The first two have already been mentioned. As for *posedět*, it is perhaps possible to trace a benefactive meaning, something like 'enjoy sitting somewhere / with someone'. Some speakers do not seem to understand the verb as containing any notion of 'small quantity' and accept sentences like

(48)   Po-seděl s námi celý den
         po-sat with us whole day
         'He was sitting here with us the whole day (?and enjoyed it)'

without any problems (cf. (29)).

However, the example that is the most interesting one in the context of this subsection is *po-stát*. It is not immediately obvious but it means 'stand *still* for a while' / 'not to move for a while', rather than 'stand for a while'. This slight shift in the meaning has the effect that *postát* can only take animate subjects:

(49a)   ??To auto tu chvíli   po-stálo   a pak jelo dál
          the car here for-a-while po-stood and then went on
          intended: 'The car stood here for a while and then went on'

However, when *si* is added, an inanimate subject becomes possible:

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[36] I take this to be a general process. Words are formed compositionally (according to the syntactic rules at the word level) but then they often start to live their own life and they gradually depart from the original meaning. It is often hard to say how far the process has gone – the changes are often slight and the original meaning still present – often, the new meanings are just added to the original one.

(49b)   To auto si   tu   asi chvilku   postojí,   než ho

the car REFL here perhaps for-a-while po-stands.FUT before it

někdo odveze

somebody takes away

'The car is going to stay/stand here for some time before anybody takes

it away'

The sentence sounds rather ironic – it suggests that it will probably take quite a lot of time before anything happens to the car.

I do not pretend that I understand how the contrast comes about. My guess is that *si* cancels the idiosyncrasy because *postát si* must be formed, independently of *postát*, at the phrase level (in the sense of Williams, 2004) – in the 'syntax', whereas *postát* was formed at the word level. On the other hand, *si* – because benefactive, I guess – somehow gives rise to the ironic meaning.[37] (It also seems to suggest that the car is able to perceive the unpleasant fact.)

I do not know whether (and how) this connects to the puzzle with the fact that *si* is obligatory in some cases. I also do not know whether this tentative suggestion makes a prediction that the *po*-verbs with *si* always have to be compositional. (Probably not, since also larger units than words might have idiosyncratic meanings.)[38]

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[37] The same ironic meaning is often invoked with animate subjects as well. If a doctor says to a patient:

(i)   Ještě si tu   asi chvilku   poležíte / pobudete

yet REFL here perhaps for-a-while po-lie.FUT /po-be-FUT

the patient understands that he/she will probably have to stay in the hospital longer than he would expect or wish to.

[38] However, the case with *postát – postát si* seems to be shedding some light on word formation. As I see it, there is some (however unclear) distinction between words that are 'listed' and word that are not. *Postát* is listed with its idiosyncratic meaning. This idiosyncratic meaning blocks the compositional one. To avoid the blocking, we use the reflexive. The reflexive signals that *postát si* is formed compositionally. There is no *postát si* listed with an idiosyncratic meaning, so, nothing blocks its compositional meaning.

Back to the verbs like *poplakat* *(*si*). I cannot think of any substantial difference between the verbs that do and that do not take *si* obligatorily. There is almost a rule that verbs denoting unpleasant activities (like cry, grumble etc.) have to take *si*. But there are also many verbs denoting pleasant or neutral activities that take the reflexive obligatorily, too (as I demonstrated in Součková, 2003). It is also not the case that only the *reflexive po*-verbs are compositional, the verbs above (46) are all compositional and do not require *si*. My suspicion is that there is nothing systematic in the contrast. At least so far, I have to leave the problem open.

2.3. <u>Summary of the properties</u>

	target of the prefix	meaning	base verbs	possibility of stacking	SI	transitivity
transitive *na*-V	DO	V a lot of DO	transitive non-quantized verbs	no(?)	no	yes
reflexive *na*-V	DO	enjoy a lot of V-ing (a lot of *se* =subject's experiencing)	non-quantized verbs	no(?)	no	yes (if *se* is in the DO position)
short time *po*-V	non-DO	V for a short time	non-quantized verbs (not directed motion verbs/verbs of transfer and change-of-state verbs)	no	no	no/yes
short distance *po*-V	non-DO	V a short distance	directed motion verbs / verbs of transfer	yes	yes/no	yes/no
low degree *po*-V	non-DO	V to a low degree	change-of-state verbs	yes	yes/no	yes/no

2.4. Double quantification?

One last remark about all the verbs prefixed by *po-* and *na-*. Even though the prefixes themselves (are said to) mean 'a lot/enough' or 'a little', it is possible to specify the quantity of the thing measured further and more explicitly, e.g. by numerals or measure adverbials:

(50)   **na**pekl **200** housek   (na-baked 200 rolls)

         natrhal **spoustu** jablek   (na-picked a lot of apples)

         naběhal **300** km   (na-ran 300 km)

         pospal si **půl hodiny**   (po-slept REFL half hour)

         poskočil **půl metru**   (po-jumped half meter)

         maličko pohubla   (a little po-lost-weight)

Potentially, this might be a problem, since one cannot say e.g.

(51)   *upekl **hodně 200** housek   (baked a lot of 200 rolls)

         *skočil **málo půl metru**   (jumped a bit half meter)

which is supposed to have approximately the same interpretation as the sentences above have.

However, the reason why one cannot say (51) is perhaps rather syntactic than semantic. There is probably no semantic restriction forbidding 'double quantification', at least not any 'double quantification' defined in such a trivial way. There is often a possibility of a narrower specification, as e.g. in *zítra ráno* (tomorrow morning) or *v pokoji na stole* (in the room on the table).

For further discussion of the presented data and related problems, see section 4.7.2.

3. The previous proposal – Filip (2000, 2004)

3.1. Summary of the proposal – Filip (2000)

Filip (2000) proposes an analysis of the same prefixes *po-* and *na-* I deal with – in Russian. She assumes that her proposal extends to all Slavic languages, so I take what she says about the prefixes as my point of departure. The Russian data she looks at are very similar to the corresponding Czech data, so there seems to be no problem in doing that.

One of the two main goals[39] of her paper is a solution of the *quantization puzzle*. The quantization puzzle is this: verbs prefixed by the cumulative prefix *na-* and delimitative[40] *po-* are not quantized, according to Krifka's definitions (52), even though they are perfective.[41]

(52)

      a) A predicate P is **quantized** iff $\forall$ x,y[P(x) $\land$ P(y) $\rightarrow$ $\neg$ y $<_P$ x]

[A predicate P is quantized iff, whenever it applies to x and y, y cannot be a proper part of x.]

      b) A predicate P is **cumulative** iff $\forall$ x,y[[P(x) $\land$ P(y) $\rightarrow$ P (x $\oplus_P$ y)] $\land$
          card(P) $\geq$ 2]

[A predicate P is cumulative iff, whenever it applies to x and y, it also applies to the sum of x and y, provided that it applies to at least two distinct entities.]

(Krifka, 1997, cited from Filip, 2000)

> "Let us now look at the quantization puzzle posed by the prefixes *po-* and
> *na-*. Take *pogulját*[P] in the sense of 'to walk for a (short) time', where *po-*
> functions as a measure of time. Suppose that *e* is an event of walking for a

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[39] The other is to show that prefixes are not markers of perfectivity.

[40] Filip (2000) uses a slightly different terminology: *accumulative na-* and *attenuative po-*.

[41] Filip explicitly agrees with the claim that "perfective verb forms are semantically quantized, or, to use other terms, telic or event-denoting" (2000, p.39), which she takes to be an assumption common in the Slavic literature.

short time, then there is a proper subevent of *e*, *e'*, which also counts as an event of walking for a short time. Hence, both *e* and *e'* fall under the denotation of *poguljáť*[P], and consequently *poguljáť*[P] fails to be quantized, according to [52a].

...

Now let us take *naguljáťsja*[P] in the sense of 'to walk for a long time'. If six hours of walking is considered to be walking for a long time in a given context (event *e*), then in the same context walking for five hours (event *e'*), may be as well, but not walking for one hour (event *e''*). This means that there are events like *e* (walking for six hours) in the denotation of *naguljáťsja*[P] 'to walk for a long time' that have a proper subpart like *e'* (walking for five hours) which is also an event in the denotation of this verb. Therefore, *naguljáťsja*[P] fails to be quantized, according to [52a]..."[42]

(Filip 2000, p.50-51)

Yet, with respect to the standard distributional tests (see 1.1.1.), they behave just like other perfective verbs that are quantized in the sense of Krifka's definition (Filip 2000, p.53).

Filip solves the puzzle, as she calls it, in the following way: the contribution of a prefix like *po-* and *na-* can be characterized in terms of an extensive measure function that applies to homogeneous predicates, yielding quantized predicates.

The semantic representation of a measure prefix like *po-* and *na-* is, then:

(53) $[[\text{prefix}]] = \lambda P \lambda x [P(x) \wedge m_c(x), \text{ where } P \text{ is homogeneous}]$

"'m_c': a free variable over (extensive) measure functions that are linguistically or contextually specified" (p.61)

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[42] Filip also shows that *poguljáť* fails to be cumulative as well, whereas *naguljáťsja* does qualify as cumulative according to Krifka's definition.

Filip uses the following definition of a measure function:[43]

(54)   *m* is an extensive measure function for a part structure P iff:

   (a)   m is a function from U_P to the set of positive real numbers

   (b) $\forall x,y \in U_P[\neg x \otimes_P y \to m(x \oplus_P y) = m(x) + m(y)]$ (additivity)

   (c) $\forall x,y \in U_P[m(x)>0 \wedge \exists z \in U[x= \quad y \oplus_P \quad z \quad] \quad \to \quad m(y)>0]$
             (commensurability)

(Filip 2000, p.61, referring to Higginbotham, 1995 and Krifka, 1998)

Moreover, as can be seen from the semantic representation Filip gives for the prefixes (53), she assumes the following restriction on the input of the application of extensive measure functions: a predicate an extensive measure function applies to can only be **homogeneous**: "the contribution of *po-* and *na-*, analyzed as measure functions, can be thought of as carving out a chunk of a certain size out of the extension of a base process verb" (p. 62).

The result is, then, a (temporally, for example) delimited event, hence, according to Filip, a *quantized* event.

By this, Filip can maintain the desired generalization that all perfective verbs are quantized, a generalization that was endangered by the facts she describes as the quantization puzzle.

3.2. Problems with Filip's analysis
I find the following parts of Filip's analysis problematic:

1) her not distinguishing between *telicity* and *quantization*
2) (if quantized = telic,) the claim that all perfective verbs (i.e. including both *po-* and *na-*verbs) are quantized
3) the claim that *po-* and *na-*, being/containing extensive measure functions, can only apply to homogeneous predicates

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[43] U_P = set of entities, $\otimes_P$ = overlap relation, $\oplus_P$ = sum operation .

4) the fact that *po-* and *na-* are treated essentially the same way

I discuss the first and second point in section 4.6. The fourth point has hopefully been already discussed, at least partly, in the previous section. I return to the difference between *po-* and *na-* in section 4.3.
As for the third problem, section 4.1. is devoted to it.
But first, I want to introduce another paper by Filip (2004), closely related to the one just summarized.

3.3. <u>Filip (2004)</u>

Closely related to the proposal just summarized is Filip's recent paper (2004).
The scope of the paper is somewhat wider – multiple prefixation and its relation to the delimitation of events – but the core of the proposal deals with the data containing the same delimitative prefix *po-*.

Following up on the idea that measurement prefixes like *po-* and *na-* are to be analyzed in terms of extensive measure functions, Filip, in this paper, looks at some potentially problematic data – namely verbs where a measure prefix combines with other prefixes in a single verb.

The general idea Filip follows is that there is only *one delimitation per event* possible. If *po-* (as well as *na-*) is an extensive measure function, i.e. a function that, as she defines it, takes homogeneous predicates and returns quantized (or telic) predicates, why may such a prefix attach to an already perfective – quantized/telic verb?

Filip takes the 'one delimitation per event' constraint basically from Tenny (1994). She quotes also Bach's 1981 paper: "we do not use the expressions that chunk up our experience with (singular) expressions that provide that experience already chunked up".

This intuitive constraint explains why we do not say **a pound of an orange*, for example.

Similarly, this is supposed to be the reason why we cannot say *run a mile for ten minutes* or *wash the clothes clean white.*

Tenny formulates the constraint as follows:

(55) **The Single Delimiting Constraint**: The event described by a verb may only have one measuring-out and be delimited only once

   (Tenny 1994, p.79)

Filip takes her telicity constraint to fall under the above Single Delimiting Constraint:

(56) **The telicity constraint**
      Telicity modifiers express functions that map atelic (homogeneous) predicates onto telic predicates: $\lambda P\lambda e[P(e) \wedge \mathrm{HOM}(P)(e)] \rightarrow [P(e) \wedge \mathrm{TEL}(P)(e)]$.
      Examples: *to the store*, *for an hour*, *a mile*, *flat*

(Filip 2004, p. 7)

What is the relation between 'one delimitation per event' constraint and the possibility of multiple prefixation?
If we agree that "[o]ne of the salient functions of verbal prefixes in Slavic languages is the delimitation of events…" (Filip 2004, p.9), the answer is rather straightforward.
In fact, Filip takes an even stronger claim to be the common view of Slavic prefixes:

(57) The ***common view*** of Slavic verbal prefixes
(i)   Semantically, Slavic verbal prefixes are telicity modifiers. They express a function that maps atelic (homogeneous) predicates onto telic

predicates: For any prefix α, [[α]] ⇒λPλe[P(e) ∧ HOM(P)(e)] →
λPλe[P(e) ∧ TEL(P)(e)]

Related assumptions:

(ii)   All perfective verbs are telic

(iii)   Slavic verbal prefixes can *only* be applied to imperfective verbs

(iv)   Prefixes are morphological exponents of the perfective operator. (Or, prefixes are grammatical markers of perfective aspect.)

(Filip 2004, p.9)

Then, how is it possible that we can have more than one prefix (more than one telicity modifier) on one verb if "it is impossible to delimit a single event more than once within a single predication" (Filip 2004, p.7)? In other words, according to what Filip calls the common view, multiple prefixation is excluded.

Filip proposes: not all prefixes map atelic predicates onto telic ones – not all prefixes delimit events.[44] Prefixes are rather predicate modifiers, functions that map sets of eventualities onto eventualities of some (other) type. I.e., there may also be prefixes that take atelic predicates as input and yield atelic predicates again and prefixes that take telic predicates and return atelic predicates. However, according to Filip (2004), there should be no prefixes to which both the input and the output are telic predicates – this is excluded by 'one delimitation per event' constraint.

Filip illustrates her proposal that the cooccurrence of different prefixes within one verbal form is at least in some cases limited by semantic constraints (of the kind above) by showing interactions between directional and measurement prefixes.

Filip observes that there is an asymmetry between Goal and Source modifiers. You can only add a measurement prefix like the attenuative (delimitative) *po-* to

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[44] Which means that in this paper, Filip retreats from the posititon that perfective verbs as a whole are quantized.

a verb prefixed by a Source prefix, but not to a verb prefixed by a Goal prefix: compare *po-od-skočit* vs. **po-při-skočit*. The reason is, Filip says, that *při-skočit* is telic/quantized already by itself, whereas *od-skočit* is atelic/homogeneous and therefore a possible input for a measurement prefix (which is an extensive measure function). In other words, only Goal modifiers (e.g. prefixes) induce a telic interpretation, Source modifiers fail to form telic predicates. Consider the following contrast:

(58a)   Od-skočil   metr od okna
         from-jumped[P] meter from window
         'He jumped a meter away from the window'

(58b)   Při-skočil ??metr k oknu
         to-jumped[P] meter to window
         'He jumped a meter to the window'

(Filip 2004, p.19, slightly modified)

Only (58a) is well formed because you can only use a measure phrase (*metr* – which is again an extensive measure function, a paradigm example of a telicity modifier, in Filip's words) to modify an atelic predicate. For Filip, also the PP 'to the window' (in 58b) is a telicity modifier but she explains the possibility of its cooccurence with another telicity modifier ('a meter') by claiming that 'a meter to the window' is a single telicity modifier, a single syntactic and semantic constituent (following Rothstein's analysis of *Dafna ran a mile to the store* in her 2003 book). In contrast, a prefix and a PP cannot form a syntactic and semantic constituent. Hence, if a prefix is a telicity modifier (Goal prefixes), it cannot cooccur with another telicity modifier (e.g. measure phrases).

Following this logic, Filip is forced to say that *skočit*[P] ('jump (once)') is not telic either, otherwise it would have to be impossible to attach a Goal prefix to it, which is false, as *při-skočit*[P] is perfect. Hence, Filip says that semelfactives in general (*skočit* is a semelfactive) are atelic (homogeneous). She claims that they are not atomic (her definition of telicity relies on the notion of atomicity) and

illustrates the point with the verb *kývnout* 'nod (once)'. The reason why *kývnout* is not atomic/quantized is that it might have a proper part that also falls under *kývnout*.

By saying this, Filip derives the following data:
po-skočit, od-skočit, při-skočit, po-od-skočit, *po-při-skočit, *při-po-skočit[45],...
(po-jump, from-jump, to-jump, po-from-jump, *po-to-jump, *to-po-jump, …)
which seems to be the desired result.

3.4. <u>Problems with Filip (2004)</u>

Although I agree with Filip (2004) in that the cooccurrence of different prefixes within one verb is at least to some extent governed by semantic factors and I am also inclined to think there is something to the 'one delimitation per event' constraint, I do not agree with the particular way how she implements these ideas.

I do not agree with

1) the claim that the verbs prefixed by Source prefixes and semelfactives are homogeneous/atelic

2) her taking *po-* and *na-* to be telicity modifiers, in the sense defined in (56), i.e. in the sense that they can only apply to homogeneous/atelic predicates and yield quantized/telic predicates (this point is essentially the same as the point 3) in 3.2.)

Moreover, I do not think Filip's analysis works – there are some rather serious inconsistencies within her proposal.

I will postpone the discussion of whether *po-* and *na-* are extensive measure functions and, if so, whether this means they cannot apply to quantized/telic predicates until the beginning of the next section.

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[45] Filip also derives **od-po-skočit* as a possible form and claims that this form actually exists, which is a judgment I (and other Czech native speakers) do not share.

Now, I will try to show why Filip's (2004) analysis is untenable even when disregarding the homogeneity constraint on the application of measure functions.

First, Filip's explanation of the data in (58) is not defensible. It can be easily demonstrated by simple pointing out that even cases like the following one should be ungrammatical according to Filip's analysis, which they are not:

(59)   OK: Při-skočil k oknu

         to-jumped^P to window

         'He jumped to the window'

(Filip 2004, p.20, ex. 26b, slightly modified)

Both the prefix and the PP are Goal modifiers, i.e. telicity modifiers, moreover, they cannot form a single constituent, hence, they should not be able to cooccur. Nevertheless, the sentence is absolutely perfect and natural (the PP is even impossible to omit except in special contexts: ??*Přiskočil*); it is not exceptional in any sense.

Whereas for English, the generalization taking only Goal (and not Source) modifiers as telicity modifiers is probably valid:

(60a)   John ran away from the car for ten minutes / *in ten minutes

(60b)   John ran to the car *for ten minutes / in ten minutes,

(Filip 2004, p. 21, ex. 28)

in Czech, the situation is very different. Both Goal and Source modifiers are compatible with both telic and atelic predicates:[46]

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[46] Taking atelic predicates to be those that are compatible with durative adverbials and telic predicates to be the ones that combine with time-span adverbials (with the exception of semelfactives).

(61a)   Šel do města hodinu / *za hodinu   ATELIC

         went^I to town hour / *in hour

         'He walked / was walking into town / towards the town for an hour'

(61b)   Šel   z města hodinu / *za hodinu   ATELIC

         went^I from town hour / *in hour

         'He walked / was walking from (the) town for an hour'

(61c)   Ode-šel   z města *hodinu / za hodinu[47]   TELIC

         from-went^P from town *hour / in hour

         'He left (the) town in an hour'

(61d)   Při-šel z   města *hodinu / za hodinu   TELIC

         to-went^P from town *hour / in hour

         'He came (back) from (the) town in an hour'

(61e)   Ode-šel do města *hodinu / za hodinu   TELIC

         from-went^P to town *hour / in hour

         'He left for (the) town in an hour'

(61f)   Při-šel do města *hodinu / za hodinu   TELIC

         to-went^P to town *hour / in hour

         'He came to (the) town in an hour'

(61g)   Od-skočil od okna *vteřinu / (*)[48]za vteřinu   TELIC

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[47] Verbs prefixed by Source prefixes seem to prefer strongly the inceptive reading when combined with time-span adverbials – in this respect, they resemble semelfactives. This is caused by the meaning of the prefix – since it is a Source prefix, it refers to the initial stage of the eventuality. It is hard to distinguish between preparing oneself for leaving and the actions that already could be described as 'leaving'. For example, when I want to leave a room, I get up from my chair and start walking. Does the walking from the chair to the door count as 'leaving the room', or is 'leaving' just the moment when I walk through the door? If the latter is true, then *odejít* is just like semelfactives and a time-span adverbial only refers to the preparatory stage. If the first possibility is right and walking from the chair to the door counts as leaving the room, then, 'leaving' takes time and time-span adverbials refer to the duration of the event of leaving the room.

from-jumped[P] from window second / (*)in second

'He jumped away (once) from the window (*)in a second'

(61h) Při-skočil   k oknu *vteřinu / (*)za vteřinu   TELIC

to-jumped[P] to window second / (*)in second

'He jumped (once) to the window (*)in a second'

The choice of a Goal/Source modifier does not influence telicity of a sentence at all, which is rather predetermined by the choice of a verbal form (whether it is perfective or imperfective).[49] When the verb is imperfective (61a-b), the situation is very similar to what we can se in English *He was running to/from the store (for five minutes)*. (61a) is an atelic sentence, even though a Goal PP is present.

In (61c-f), on the other hand, the sentences are telic, despite the fact that in one case (d, f), the verb is prefixed by a Goal prefix (*při-*) and in the other case (c, e) it is prefixed by a Source prefix (*od-*).

The sentences in (61g, h) show essentially the same thing with the difference that *při-skočit* and *od-skočit* are semelfactives, which can be seen from their incompatibility with both durative and time-span adverbials. In this respect (punctuality), their character is not different from that of *skočit*.

This is, in fact, a fatal problem for Filip's analysis: according to her, *přiskočit*, since semelfactive, must be atelic, which is in contradiction with her claim that *přiskočit* is telic, since *při-* is a telicity modifier (and therefore an impossible input for *po-*).

I find this inconsistency very serious – actually, it shows that her analysis of Goal prefixes and semelfactives is wrong.

In fact, the whole argumentation concerning semelfactives is unconvincing. A reader acquainted with the (2000) paper by Filip might remember she argued that

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[48] Only the inceptive meaning is possible – i.e. the temporal adverbial refers to the duration of the preparatory phase.

[49] English verb forms (the simple ones) are underspecified as for their telicity – there are other than morphological devices for determining the aspect of a sentence.

51

po- and *na-*verbs are quantized (in her terminology that is the same as telic) in spite of the fact that there are subparts of *po*-walk and *na*-walk that also qualify as *po*-walk and *na*-walk, respectively (see 3.1.). So, there, Filip argued that verbs prefixed by measurement prefixes *po-* and *na-* are quantized *despite* their failure to fulfill Krifka's definition of quantized predicates (52); here, the argument is reversed: semelfactives like *kývnout* are not quantized *because of* their failure to fulfill Krifka's definition of quantized predicates.

As I see it, Filip could claim that *kývnout*, despite its apparent non-quantizedness, is in fact telic, due to its suffix contributing the meaning 'once' – just like *po-chodit* and *na-chodit* are quantized due to their prefixes.

(I will return to the problematic behavior of predicates like *kývnout*, *pochodit* etc. with respect to Krifka's definition of quantizedness in section 4.6.3.)

So, I would conclude there is no convincing evidence for taking either semelfactives or verbs prefixed by Source prefixes as homogeneous predicates; in fact, there is just the opposite evidence (the incompatibility with durative temporal adverbials). Hence, Filip's particular understanding of the 'one delimitation per event' constraint cannot be right and the rules determining the acceptable combinations of prefixes must be stated in a different way.

As for the possible combinations of *po-* with the directional prefixes, see section 4.5. for a possible explanation.

4. Analysis

4.0. <u>Outline of the analysis</u>

In this subsection, I want to sketch the analysis that will be developed in the following sections.

I take *po-* and *na-* to have the meaning essentially as the one proposed in Filip (2000), i.e. as containing a measure function. On my analysis, there is no homogeneity requirement for the application of extensive measure functions, though.

However, there *is* a general condition on application of the measurement prefixes (containing measure functions), namely that the verbal predicates that *po-* and *na-* combine with have to have some sort of scalar structure as part of their meaning. The measure prefix then has the effect of delimiting/measuring an interval on a scale – just like in *2 meters tall* the measure phrase *2 meters* delimits/measures an interval on the scale of tallness.

The scale *po-* and *na-* can apply to cannot be just any scale, though. *Po-* and *na-* are (usually) used for delimiting events the *na-* and *po-*verbs refer to. To achieve this effect, the prefixes have to apply to the scale that is the relevant one for the delimitation of the event.

To give a concrete example:

Let us imagine a degree achievement verb, e.g. *widen*. For this verb, the relevant scale is a scale related to the property that is being changed when an object undergoes widening (i.e. a scale of width). If one widens a road, the degree to which the road is wide at the end is bigger than the degree to which it was wide at the beginning of the event. This difference between the initial and final state/degree can be measured, as in *they widened the road 5 meters*. The measure phrase *5 meters* has the effect of delimiting the change the road has undergone and, by that, delimiting the event of widening the road.

Essentially the same analysis can be proposed also e.g. for verbs with an incremental path argument. For them, the relevant scale is the one capturing progress along the path. A delimited path corresponds to a delimited interval on the scale. This, again, can be measured by an explicit measure phrase as in *walk*

6 miles or *descend 2 meters*. When the path in this kind of event is delimited, the event itself is also delimited.

A measure prefix like *po-* or *na-* has essentially the same effect as a measure phrase. It also applies to a scale and returns an interval on the scale. Since the scale is directly linked to the event structure, creating the delimited interval has the consequence of delimiting the event.

Actually, this is one of the two possible scenarios – at least for *po-*.

The other possibility is that the predicate a measure prefix attaches to is already delimited. The fact that a predicate is delimited means that there is a delimited interval on the scale relevant for the delimitation. *Po-* and *na-*, then, measure the length of the interval (without delimiting it again).

So, both *po-* and *na-* refer to lengths of intervals on scales. What is the difference between the two prefixes?

The difference is that *po-* and *na-* do not apply to the same kinds of scales. In fact, they are rather in complementary distribution. The complementary distribution of *po-* and *na-* is, however, hard to define in the semantic terms. The condition specifying to what *po-/na-* can or cannot apply is a syntactic one. *Na-* applies to whatever is in the direct object / structural accusative case position. *Po-* applies to all other kinds of scales but crucially not to the ones connected to the direct objects. In other words, the domain of application of *po-* is a complement of the domain of application of *na-*.

This is the core of my proposal, which I develop in section 1 (*po-* and *na-* as containing extensive measure functions), section 2 (constraints on the input for the prefixes) and section 3 (complementary distribution of *po-* and *na-*). Section 4 provides a detailed analysis of all classes of *po-* and *na-*verbs.

After introducing the central part of my analysis, I look at more general problems of measurement, delimitation and telicity – in direct connection to the analyzed prefixes. These are discussed in section 5 (possible combinations of directional and measure prefixes) and section 6 (delimitation and telicity). Section 7 collects

the last bits and pieces to be discussed (perfectivity and its relation to delimitation/telicity; the problem of double quantification).

4.1. *po-* and *na-* as containing extensive measure functions

I assume basically the same semantics for *po-* and *na-* as proposed in Filip (2000) (cf. 53), except for the homogeneity condition:

(62) $[[\text{measure prefix}]] = \lambda P \lambda x[P(x) \wedge m(x) = c]$

P is a predicate, *m* is a measure function and *c* is some contextually determined value. What exactly *x* is will be discussed in section 4.3; in the meantime, let us just assume it can be either an event variable or an individual variable.

I have removed the homogeneity requirement for the reasons that I will discuss immediately.

Let us demonstrate the point using *po-*[50]. Its possibility of application to quantized predicates (*po-skočit* po-(jump[P]), *po-vy-lézt* po-(out-crawl[P]), …) led Filip (2004) to claim that all verbal predicates to which *po-* can attach are in fact atelic (even though it did not seem to be the case; cf. section 3.3.).

But why is it actually problematic to assume that *po-*, presumably containing a measure function,[51] can also apply to quantized predicates?

If we take e.g. *vy-lézt* (out-crawl[P]), a telic verb, according to the 'in an hour' diagnostic (and contra Filip, 2004)

(63)   Vy-lezl   z toho tunelu *minutu / za minutu
         out-crawled out-of the tunnel *for a minute / in a minute
         'He got out/crawled out of the tunnel in a minute'

---

[50] In fact, *na-* requires that a predicate it attaches to be homogeneous. Since *po-* does not, the requirement cannot be stated as a general property of measure prefixes/measure functions.

[51] The measure function in question would be something like *quantity*, *po-* meaning 'small **quantity**': po-(x) = small-quantity-of (x). Or: quantity(x) = small.

we can see that it is possible to attach delimitative *po-* on top of it: *po-vy-lézt*.

But how to describe the role of *po-* in verbs like *po-vy-lézt* ('crawl out a bit')?

My intuition about *po-vy-lézt* is that *po-* does not carve out a little chunk out of unbounded (out-)crawling;[52] it just specifies how big the chunk, already delimited (cf. the telicity of *vy-lézt*), is.

I can see no principled reason why it should be impossible to measure bounded/delimited things. Actually, an excursion to a nominal domain may be very useful because there are some clear cases to be found there, where an expression containing an extensive measure function modifies a quantized (delimited) predicate.[53]

4.1.1. <u>Summary: Schwarzschild (2002) – The Grammar of Measurement</u>

Schwarzschild, in his article (2002), is mainly concerned with measure phrases that are included in so called pseudopartitives, on the one hand, and compounds, on the other hand.

Why do we say *a foot of cable* (using a pseudopartitive construction) when speaking of length, while we can only say *quarter inch cable* (using a compound) and not *a quarter inch of cable* when we are concerned with the diameter?

To explain the difference, Schwarzschild employs the notion of *monotonicity*.

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[52] Filip (2000) uses the metaphor of *po-* and *na-* carving chunks of certain size out of homogeneous predicates.

[53] It is well known that there are certain analogies between nominal and verbal predicates. The homogenous – quantized distinction is applicable to both, for example. There is a correlation homogeneous – mass/bare plurals vs. quantized – count, i.e., for an NP, to be a homogeneous predicate means to be a mass expression (or a bare plural); a quantized predicate is expressed by a count noun.

Measurement systems are based on some property, e.g. weight or temperature. The goal of such a system is to reflect the degree to which an entity has the property in question.

> Now while all measurement systems mirror the degree to which an entity has the property in question, some but not all mirror as well the intuitive part structure of the stuff being measured. For example, if a quantity of oil has a certain volume, then every proper subpart of it will have a lower volume and superparts will have larger volumes. On the other hand, if the oil has a certain temperature, there is no reason to expect that proper parts of it will have lower temperatures. We will call a property **monotonic** if it tracks part-whole relations. Volume is monotonic and temperature is **non-monotonic**.

(p. 2)

If we look at pseudopartitives and compounds, the generalization is that, in the case of pseudopartitives, the property that forms the basis for measurement has to be monotonic (with respect to the given part-whole structure), whereas for compounds it has to be non-monotonic.

So, now we have an explanation for the fact that *a foot of cable* (length), *two feet of snow* (depth – monotonic for fallen snow) or *five ounces of gold* (weight) are all well-formed expressions, whereas **a quarter inch of cable* (diameter), **zero degrees of snow* (temperature) or **twenty carats of gold* (purity) are not. The same is true for the reverse: we cannot say **two liter oil*, while *ninety degree oil* is felicitous.[54]

Schwarzschild mentions that Krifka makes use of the term *extensive measure function* when pointing out essentially the same contrast. *Five ounces of gold* is

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[54] As Schwarzschild (2002) also points out, in other languages, the non-monotonic measure phrase (corresponding to *zero degree* in *zero degree water*) is syntactically an adjective. This is true e.g. for German or Russian. In Spanish, the difference is expressed by reversing the order of the measure phrase and the substantive, like in *dos litros de agua* ('two liters of water') vs. *agua de dos grados* ('two degree water').

well-formed, while *twenty carats of gold is not. The difference is that *ounce* but not *carat* denotes an extensive measure function.[55]

Now, let us look at the mass-count distinction.

So far, the *substantive* (the expression referring to the stuff being measured) has always been a mass term. Count nouns behave differently. It is not natural to say *seven pounds of baby*, but *a seven pound baby* is perfectly grammatical. The reason is that count nouns do not have a part-whole structure (or, as Schwarzschild puts it, they have only a *trivial* part-whole structure) – they are atomic.[56] Since monotonicity fails in these cases, having no part-whole structure to operate on, there is no possibility for forming pseudopartitives. Hence the following contrasts:

(64)

(a)   *two hour work   a two hour job
        two hours of work   *two hours of job

(b)   *two page prose   a two page story
        two pages of prose   *two pages of story

etc.

(examples from Schwarzschild 2002)

4.1.2. **What we can conclude from Schwarzschild (2002)**
If we look at the examples in (64a-b), we can see that in both pseudopartitives and compounds the measure phrases contain expressions denoting measure functions: *two **hours** of work, a two **hour** job*; *two **pages** of prose, a two **page** story… A story* and *a job* are clearly quantized (nominal) predicates but still one can measure them (apply a measure function to them).

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[55] In the following subsection, I argue that Schwarzschild's proposal is more general than – and by that superior to – the one of Krifka's.

[56] In the sense that parts of babies do not count as babies. Otherwise, babies do have parts, of course.

58

Krifka's point (e.g. 1987) that *twenty carats of gold is not a well formed expression since *carat* is not an extensive measure function is correct, but less general than Schwarzschild generalization. It is really the monotonicity of the measured property – with respect to the given part-whole structure – what matters here.

Things may become clearer if we consider a triple like the following one: *twenty **carats** of gold (*twenty carat gold*), *a quarter **inch** of cable (diameter – OK: *quarter inch cable*), *two **feet** of cable (length - *two foot cable*).

Purity (measured in carats) is *never* a monotonic property. *Carat*, measuring a property that is always non-monotonic, is, then, always a non-monotonic, non-additive measure function.[57] Additivity is one of defining properties of extensive measure functions – so, from this we can see that *carat* is not one.

Length (measured e.g. in inches or feet), on the other hand, *is* in principle a monotonic property (and *foot* is an extensive measure function). Moreover, in *two feet of cable*, it *is* monotonic also *with respect to the part-whole structure* of the cable.

In *quarter inch cable*, however, the length – of the diameter – *is not* monotonic *with respect to the part-whole structure* of the cable. Nonetheless, since the property itself (length) *is* monotonic, the measure function (*inch*) is also monotonic (moreover, it is additive – *inch* is an extensive measure function).

Here we can see that it is not the *extensiveness of the measure function* what matters for the pseudopartitive – compound distinction. It is really rather the *monotonicity of the (measured) property with respect to the relevant part-whole structure* – just like Schwarzschild (2002) says – what makes the difference. Or, to put it differently, non-extensive measure functions (like *degrees Celsius*, *carats* etc.) can never be part of measure phrases in pseudopartitives, but extensive measure functions can be part of measure phrases in both pseudopartitives and compounds.

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[57] Additivity is a special case of monotonicity – thanks to Øystein Nilsen for clearing up this point to me.

If we look at the count – mass distinction, essentially the same generalization applies. In *seven pounds of oranges*, weight is monotonic with respect to the relevant part-whole structure; in *a seven pound baby*, it is not (since *a baby* has no non-trivial part-whole structure, as Schwarzschild puts it). Nevertheless, weight is in principle a monotonic property and *pound*[58] is an extensive (monotonic and additive) measure function regardless of whether it is a part of a compound or pseudopartitive.

That *pound* in *a seven pound baby* is an extensive measure function can be seen if we test the example against the defining property of extensive measure functions that is the crucial one here:

(65) $\forall x,y \in U_P[\neg x \otimes_P y \rightarrow m(x \oplus_P y) = m(x) + m(y)]$ (additivity)

(cf. 54b)

If we take two seven pound babies (babies usually meet the condition on non-overlapping: $\neg x \otimes_P y$) and apply a measure function (*pound*) to them ($m(x \oplus_P y)$) we get the same value (fourteen) as when we apply the same measure function to each of the babies in turn and then we take the sum of the values ($m(x) + m(y)$):

(66) $pound(baby_1 \oplus_P baby_2) = pound(baby_1) + pound(baby_2) = 14$

(The same does not hold for e.g. temperatures of the babies.)

So, back to *po-* and Filip (2004):
Since we have seen that extensive measure functions can apply both to homogeneous and quantized nominal predicates, I believe that there is no reason

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[58] The difference between *seven pounds* (in pseudopartitives) and *seven pound* (in compounds) should not matter. Here, I am not interested in the syntax of the constructions (anyway, it differs from language to language), but rather in the meaning of the measure phrases. And the meaning should be the same in both kinds of constructions. Essentially, when you put a seven pound baby on scales, you get the same value as when you put seven pounds of oranges there.

to assume that *po-*, containing an extensive measure function, should not be able to apply both to homogeneous and quantized (verbal) predicates.

Hence, there is no reason to assume that *po-* is a telicity modifier in the sense of Filip (2004, here (56)) and therefore there is also no reason to claim that the semelfactives and verbs prefixed by Source prefixes are atelic/homogenous as Filip (2004) does. The data like **a pound of an orange* or *po-při-skočit (*po-to-jump (once)) are to be explained in some other way. Why **a pound of an orange* is ungrammatical has already been shown – in a convincing way, in my opinion – by Schwarzschild (2002). In section 4.5., I propose a possible account for *po-při-skočit.

In what follows, I assume that *po-* is underspecified with respect to whether it can apply to quantized or homogeneous predicates; it is both like *7 pounds of* and *7 pound*, so to speak.[59] Generally, I assume that there are measure expressions that can only modify homogeneous predicates (*7 pounds of*) and others that can only modify quantized predicates (*7 pound*) but I take this to be a property of a particular type of expressions, not a property of measure functions contained in them.

4.2. <u>What is a possible input for *po-* and *na-*?</u>

Since I characterize the class of verbal predicates that are possible inputs for *po-* and *na-* referring to scales, it is necessary to introduce the model that make use of these entities.

4.2.1. <u>Scale structure</u>

I adopt the model of the scalar structure as assumed and developed in work by e.g. Kennedy (2000), Hay, Kennedy and Levin (1999), Kennedy and McNally (1999, 2002), Kennedy and Levin (2002), Rotstein and Winter (2003) etc.

I take a scale to be a set of points (degrees) totally ordered along some dimension:

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[59] I make no such claims about *na-*. *Na-* only combines with homogeneous predicates.

"Formally, a scale is a pair $\langle S, \geq_\delta \rangle$ consisting of a set of objects and an asymmetric ordering relation along some dimension δ" (Kennedy and McNally, 2002, p.8).

Scales can have different properties: they can be finite or infinite, dense or discrete etc. Here, I focus on the same parameter as e.g. Kennedy and McNally (2002) do, namely whether a scale is *open* or *closed*, since this parameter becomes relevant in section 4.5.
Open scales are those that do not have minimal/maximal elements; closed scales do have minimal/maximal elements.

Kennedy and McNally (2002) give the following typology of scales (with respect to whether they have maximal/minimal elements):

(67) *A typology of scale structures*[60,61]

a.	$\langle S_{(0, \infty)}, \leq_\delta \rangle$	OPEN
b.	$\langle S_{[0, \infty)}, \leq_\delta \rangle$	LOWER CLOSED
c.	$\langle S_{(0, 1]}, \leq_\delta \rangle$	UPPER CLOSED
d.	$\langle S_{[0, 1]}, \leq_\delta \rangle$	CLOSED

(Kennedy and McNally, 2002, p. 10)

They also demonstrate – using examples of different gradable adjectives – that all the four types are attested. They use the maximizing modifier (*absolutely*), as

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[60] Under the assumption that scales consist of sets of points that are isomorphic to the real numbers.

[61] Kennedy and Levin (2002) introduce the same typology of scales, with the difference that in (67a) and (67b), instead of ∞, the upper endpoint of the scale is specified as 1. Neither Kennedy and McNally (2002) nor Kennedy and Levin (2002) comment on the choice; so, I simply choose to call a scale open when it extends to infinity because it fits my analysis better.

they call it, as a tool for determining whether a scale has a maximal/minimal element. Positive adjectives are compatible with *absolutely* (and other proportional modifiers) only if they use a scale with a *maximal* element and negative adjectives[62] only combine with *absolutely* if they use a scale with a *minimal* element:[63]

(68)   *Open scales*
        a. ??absolutely {tall, deep, expensive, likely}
        b. ??absolutely {short, shallow, inexpensive, unlikely}

        Lower closed scales
        a. ??absolutely {possible, bent, bumpy, wet}
        b. absolutely {impossible, straight, flat, dry}

        Upper closed scales
        a. absolutely {certain, safe, pure, accurate}
        b. ??absolutely {uncertain, dangerous, impure, inaccurate}

        Closed scales
        a. absolutely {full, open, necessary}
        b. absolutely {empty, closed, unnecessary}

(Kennedy and McNally, 2002, p. 12, exx. 24-27)

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[62] For the distinction between positive and negative gradable adjectives, see e.g. Kennedy (2000). "[T]he crucial semantic difference between polar antonyms like tall/short, empty/full, expensive/inexpensive, accurate/inaccurate, pure/impure and so forth is a scalar one: both members of an antonymous pair map their arguments onto the same scale (e.g. both tall and short map their arguments onto a scale of height), but they make use of inverse ordering relations" (Kennedy and McNally, 2002, p. 11).

[63] Rotstein and Winter (2003) take *completely* to relate to a standard of completeness and not to the endpoint of a scale (see subsection 4.5.5. for the discussion).

4.2.2. <u>Condition for the application of *po-*/*na-*: presence of a scale structure</u>

I argue that the verbal predicates that allow modification by a measure prefix have something in common – they all involve some kind of scale structure in their meaning.

What are the classes of verbs *po-* and *na-* combine with?

For *po-*, these are:
a) directed motion verbs
b) degree achievements
c) simple activity verbs

For *na-*:
d) 'incremental theme' verbs
e) 'incremental experience' verbs[64]

All the classes, except for (e) are generally recognized and familiar classes of verbs. Especially, (a), (b) and (d) are well known from literature on aspect.

Hay et al. (1999), Kennedy and Levin (2002) argue that these three classes of verbs, which have played a crucial role in work on telicity – incremental theme verbs (creation/destruction verbs), directed motion verbs and degree achievements[65] – can be actually unified.
They say that "these verbs all describe events in which one participant […] undergoes some sort of gradual change – in volume or spatial extent, in location along a path, or in the degree to which it possesses some gradable property" (Kennedy and Levin, 2002, p. 2). This entire class of verbs can, then, be called *verbs of gradual change*.

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[64] This is actually just a term of convenience. Verbs like these do not exist without *na-*. What is important, though, is the presence of the 'incremental experience' scale that serves as the input for *na-* here (see further).

[65] Especially incremental theme verbs have been important. But see e.g. Ramchand (1997), Tenny (1994) as an example of work on aspect including the other two as well.

In Hay et al. (1999) the authors stress that in case of the incremental theme verbs, it is necessary to distinguish between the argument itself and the incremental/gradable property that changes as the event develops. So, "[r]eturning to Dowty's original example, *mow the lawn*, the true incremental theme, we claim, is not the lawn, but rather its area – a property of the lawn" (Hay et al., 1999, p.15). This distinction between the argument itself and its gradable property is necessary for the unification of the class of incremental theme verbs and the other two classes into the class of verbs of gradual change.

Once this has been said, the generalization about telicity of these verbs can be stated as follows:

> "More generally, all three types of telicity can be determined as a function of the boundedness of the difference value defined over a projected scale associated with one of the verb's arguments, where the nature of the scale depends on the lexical meaning of the verb."

  (Hay et al., 1999, p. 15)

Or:

> Telicity is determined by whether the 'degree of change' argument *d* is quantized or not

  (Kennedy and Levin, 2002, p. 2)

This is exactly the kind of analysis I need in order to be able to define a class of possible inputs for *po-* and *na-*. Namely, my claim is going to be that measure prefixes only attach to verbs (predicates) of gradual change.

Now, I have to demonstrate that also the remaining classes of verbs are to be included in the class of verbs of gradual change – or rather in the class of verbs describing events of gradual change.

If we consider 'incremental experience' verbs first, we can say that the scale associated with these verbs (or rather with this *use* of the verbs) is the one that consists of different degrees of having experienced / feeling satiated by undergoing some activity. (It must be the reflexive that instantiates the link between the scale and the verbal predicate.) The point on the scale that corresponds to the end of the event could be said to denote the degree best described as 'satiated' or 'having experienced something enough / to a sufficient degree'. We can use a name 'scale of incremental experience' for this scale.

Now, the class of simple activity verbs (which serve as a basis for deriving short time *po*-verbs) does not seem to have any kind of scale like the ones associated with a path, property etc. The only scalar thing included in the semantic representation of these verbs is time/temporal duration. And this is exactly the scale *po*- applies to here – it has to apply to something and this is the only scale available.

Now, is it not strange that this is not a possibility with other verb classes, too? Basically all events have temporal duration, so why is it that *po*- in *po-vy-táhnout* (po-out-pull/drag), for example, has to choose the scale associated with a path and not the temporal scale?

In the next subsection, I will propose an answer for this question.

4.2.3. <u>Which scales are relevant / visible for measure prefixes?</u>

In the following paragraphs, I propose a general restriction as for which scales are possible inputs for measure prefixes like *po*- and *na*-.

The generalization is this:

(69)   a measure prefix can only apply to the scale that is responsible for
         delimiting a given event.

There are different classes of verbal predicates describing different types of events. For each of these types, a different subpart/aspect of the event –

corresponding to a different kind of scale – is central. In other words, for every class of verbs, the relevant scale can be unambiguously determined (cf. the first citation on p.66: "the nature of the scale depends on the lexical meaning of the verb").

As for the incremental theme verbs, the relevant subpart of the event – the relevant scale – is a scale of a property of an incremental theme argument that is crucial for a given event (e.g. its volume, area etc.).[66] If this property is delimited, the event is delimited.

If we take directed motion verbs, on the other hand, it is a path what matters, or, to put it in terms of scalar structure, a scale consisting of different degrees of progress along a path. So, if the event is to be delimited the path associated with it has to be delimited.

As for degree achievements, a scale responsible for delimiting the event is a scale of the property that is being changed in the event. So, again, if this change is bounded, the event is bounded...

If there is nothing else in the meaning of a verb, no other scale than the scale of temporal duration, this is the one that is important for making the event delimited. In other words, if one wants to present e.g. sleeping as a delimited event, one has to delimit its duration, as in *he slept from 3 to 6* or *po-spal si* (po-slept.3.sg.m.PAST REFL).

This is just to illustrate what I mean by 'a scale that is responsible for delimiting an event'. A more detailed discussion of all relevant classes of *po-* and *na-* will be given in section 4.4.

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[66] In fact, there *is* room for certain ambiguity (as opposed to what I said in the preceding paragraph): as for an incremental theme argument, for example, a scale underlying it may correspond to more than one property of the incremental theme (e.g. *thickness* or *area* in cases like *scrape the paint off the wall.* I.e. one may choose among different scales in certain contexts.

Now, there is a question. Why this constraint? Why is only a scale relevant for the delimitation of the event available for the application of a measure prefix? There does not seem to be any similar constraint for other measure expressions/phrases. For example, *přemýšlet trochu* (think a bit) can mean both 'think for a while' and 'think superficially/not intensively'. *Po-přemýšlet*, though, can only mean 'think for a while'; similarly, *po-vy-táhnout* can only mean 'take/pull out a bit' and not 'take/pull out for a while'.

A natural explanation for this seems to be that prefixes in general make verbs perfective, which usually means that they delimit the events the verbal predicates describe. What does a prefix do when it delimits an event? The answer is: it delimits the 'degree of change' or the 'difference value' (see 4.2.2. above) on the relevant scale. It is intuitively quite clear that if *po-* and *na-* delimit an interval/degree of change on this scale, its quantificational meaning applies to the same interval/degree of change on the same scale. Actually, delimitation and measurement are – usually[67] – just two sides of one process – one delimits an event by measuring it.

Po-přemýšlet cannot mean 'think superficially' because a scale of intensity is never a scale that serves as a basis for delimitation; hence, the impossibility of *po-* measuring the scale.

What about the case when *po-* measures an interval delimited already? How do we guarantee that the prefix measures this interval and does not apply to a completely different scale? Take *po-vy-táhnout* ('pull out a bit'), for example. *Vy-táhnout* ('pull out') is associated with a delimited interval (of unknown length) on a scale – path. *Po-*, then, measures the delimited interval and does not create a new one, on a temporal scale, for example.

There may be some principle saying that delimiting and measuring can never be independent of each other. This could be said to follow from the fact that applying a prefix to a different scale (than the one with the already delimited interval) would lead to delimiting a new interval. I would not expect this to be possible (recall the ban on multiple delimitation of a single event assumed by Tenny, 1994

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[67] The other case is the case when a measure prefix measures something that is already delimited.

or Filip, 2004). On the other hand, this does not necessarily explain why a temporal scale in particular cannot be a possible input for *po-* when the predicate is already delimited, since I assume a mapping between events and their temporal traces, in the sense of Krifka (e.g. 1992). If a delimited interval, say, on a scale of progress along a path is mapped – via the event – onto a temporal trace/scale, I expect there – on the temporal trace – to be a delimited interval, too, that could be potentially measured, without violating the constraint against multiple delimitation.

So, to conclude the discussion, I assume a constraint saying that a measure prefix can only apply to the scale responsible for the delimitation of a given event, no matter whether there already exists a delimited interval on the scale or not. As for the case when the delimited interval does not exist yet, I take the constraint to follow from the fact that the prefix delimits and measures the event at the same time and these are in fact two sides of a single process. As for the case when the delimited interval does exist already, I am not able to derive the constraint at the moment but I believe it follows from some general principles governing measurement and delimitation.

To sum up, there are certain constraints on the application of measure prefixes. First, there is the requirement that a measure prefix can only apply to something that has a scalar structure.[68] This is presumably a general requirement of measure expressions. In terms of Hay et al. (1999) and Kennedy and Levin (2002), *po-* and *na-* apply to verbs of gradual change.
The other requirement, namely that the scale has to be the one that is crucial for delimiting the event probably follows from the prefixal status of *po-* and *na-*; it is not common for all measure expressions.

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[68] The requirement might be actually stricter – see section 4.5.

4.3. <u>The complementary distribution of *po-* and *na-*</u>

Having specified what *po-* and *na-* have in common (their semantics containing an extensive measure function, the conditions on application – scalar structure), let us look at the differences.

A difference that has been already mentioned (in footnotes) is that *na-*, unlike *po-* only combines with non-quantized predicates. Since I do not assume the homogeneity requirement for extensive measure functions, I take the requirement to be specific for individual measure expressions, here, for *na-*. The requirement is either purely syntactic, or follows from something in the semantics of *na-*. Since I have not investigated in sufficient detail what exactly *na-* (and *po-*) means, I leave the question open.

Here, I focus more on another difference.

The difference is that *po-* and *na-* apply to different, in fact non-overlapping things. This difference in the domain of application apparently cannot be stated in semantic terms, however. I.e. the difference does not seem to follow from that *po-* means 'a little' and *na-* means 'enough', nor from any additional semantic constraints I can think of. The distinction is rather structural.

That is, *na-* only applies to scales associated with whatever is in the direct object position. As we have seen in section 2.1., the target of *na-* is either the (accusative) reflexive or a (regular) DP in the direct object position.

Po-, on the other hand, can apply to all the other scales that determine whether the event is delimited or not, but crucially never to a scale associated with the direct object.

The syntactic character of the distinction can be best illustrated by a comparison of a *po-*verb and a *na-*verb, both providing the same kind of scale, but associated with a different syntactic position in each case.[69]

Before doing that, I want to introduce the diagnostic I am going to use.

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[69] I owe the following argument to Jakub Dotlačil.

70

The diagnostic makes use of a change in case of the embedded direct object (ACC → NOM) in certain restructuring constructions. In a simple sentence like:

(70a)   Martin zabil *Franka*
         Martin killed Frank.ACC
         'Martin killed Frank'

the internal argument is in the structural accusative position.
Then, when such a clause is embedded under a restructuring modal verb like *dát se* ('be possible'), the original direct object can get the nominative case.

(70b)   *Frank*   **se**   **dá**   zabít jednou   ranou
         Frank.NOM REFL MODAL kill one.INSTR punch.INSTR
         'One can kill Frank with one punch'

This is not an option for objects with inherent cases:

(71a)   Jakub pomohl *Frankovi*
         Jakub helped Frank.DAT
         'Jakub helped Frank'

(71b)   **Frank*   se   dá   pomoci snadno
         *Frank.NOM REFL MODAL help easily
         intended: 'One can help Frank easily'

         (OK: Frankovi.DAT se dá pomoci snadno)

In the following examples, both the *po*-verb and *na*-verb are associated with the same scale (responsible for the non-/delimited status of the event), namely the one that we can (simplifying a bit) call a path.

(72a)   u-jet   / **na**-jet stovky   km
         PfPr-drive / na-drive hundreds.ACC km

(72b)   **po**-po-jet dva metry

          po-po-drive two meters.ACC

(72c)   V tomhle autě se   **dá**   / **dají**   (ujet /) **na**-jet

          in this car REFL MODAL.3.sg   / 3.pl   (PfPr-drive/)   na-drive

          stovky   **kilometrů** bez jakýchkoli problémů

          hundreds.**ACC/NOM** (of) km without any troubles

          'In this car, one can drive hundreds of kilometers without any trouble'

(72d)   Na tomhle parkovišti se   **dá**   / **??dají po**-pojet do jakékoli

          in this parking lot REFL MODAL.3.sg / ??3.pl po-po-drive in any

          strany maximálně **dva metry** (bez srážky s jiným vozem)

          direction max. two meters.**ACC/??NOM** (without crash with other car)

          'In this parking lot, one can drive at most two meters in any direction

          (without crashing into another car)

In both cases, the measure phrases (*stovky kilometrů* and *dva metry*) are accusative. However, only with the *na*-verb (and the *u*-verb (72a,c)) is the accusative structural; i.e. *stovky kilometrů* is in the direct object position. In (72b, d), the measure phrase is an adjunct; the accusative case is not structural. This can be seen from the im-/possibility of the measure phrases getting the nominative case when embedded under *dát se*.

In (72c), we can see from the agreement morphology on the matrix (restructuring) verb that *stovky*, the syntactic head of the measure phrase, can be nominative and agree with the verb. Assuming that this is an option only for DPs in structural case positions, the fact that *dva metry* in (72d) cannot be assigned the nominative case (and agree with the matrix verb) indicates that the accusative on *dva metry* is not structural, i.e. the measure phrase *dva metry* is not in the direct object position.

That *dva metry* does not have the option of being nominative here can be seen from the fact that the matrix verb (*dát*) can only have the default agreement morphology (3.sg.).

(See Dotlačil, 2004, for discussion regarding these constructions, as well as an analysis of other restructuring phenomena in Czech.)

Now that we have seen the syntactic difference (different selection properties) between *po-* and *na-*, the question is: what does this mean?

In syntactic terms it could mean that *na-* attaches lower than *po-*, e.g. above the direct object but inside VP. *Po-* would probably be more adjunct-like, since it probably targets the whole VP. One could perhaps say that *po-* is too high to bind the direct object variable, so it can only bind the event variable.

However, I do not have much to say about the syntax of the prefixes. What I would like to be able to decide, though, is whether one should say that both *po-* and *na-* measure events (with the condition that *na-* only does this via the direct object and *po-* never), or whether it is more appropriate to say that *po-* applies to events and *na-* applies to individuals.[70]

If it were not for the class of the 'incremental experience' verbs (i.e. cases like *na-smál se* – he na-laughed REFL), one could seriously consider the option that *na-* only applies to individuals. However, since the reflexive *se* could not be really said to refer to individuals here, it is safer to say that *na-*, just like *po-*, applies to events.
Actually, one could still claim that in cases like *na-trhal jablka* (na-picked apples) *na-* quantifies over individuals but, then, this would seem to mean that there are two *na-*'s, which is not the best result . What is important is that even in cases like *na-trhal jablka*, it does no harm to take *na-* as measuring/delimiting events, since a delimited interval on whatever scale is associated with the direct object leads to a delimited event.

Therefore, I propose that the *x* variable in (62) is in fact an event variable, both with *po-* and *na-*:

(73)

(a) $[[po\text{-}]] = \lambda P \lambda x [P(e) \wedge m(e) = c_{relatively.small}]$

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[70] This is the reason why I did not specify what x is in (62), section 4.2.

(b) $[[na\text{-}]] = \lambda P\lambda e[P(e) \wedge m(e) = c_{big.enough}]$ [71]

4.4. **What the prefixes measure in each class of *na*- and *po*-verbs**

In the present section, I am going to go through all the classes of *po*- and *na*-verbs, one by one, and show what the prefixes measure in every particular class and how the delimitation of the events these verbal predicates describe is carried out.

I am not going to provide many examples in these subsections – only a minimal amount of data will be used for illustrating the point. However, see sections 2.1. and 2.2. if necessary.

4.4.1. **Type *nanosit židle* (transitive *na*-verbs/incremental theme *na*-verbs – section 2.1.1.)**

This class can be represented by an example like (4a), repeated here:

(74)   Petr sem na-nosil   židle / nábytek / vodu
        Petr here na-carried chairs / furniture / water
        'Petr brought a lot of chairs / furniture / water here'

This class of *na*-verbs can be called incremental theme *na*-verbs, since the scale relevant for the delimitation is the one associated with the incremental theme argument. What distinguishes this class of verbs from other incremental theme verbs, though, is the fact that the scale cannot be just any scale of any property the incremental theme has. Specifically, the only scale *na*- ever applies to in this class of verbs is a scale of quantity (never a scale connected to the spatial extent of the incremental theme argument, for example).[72]

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[71] c means that the value is dependent on context. Or, one may say that the value of m(e) is *bigger/smaller than* some contextually determined number, as Filip (2000, p.62) does:

$[[na\text{-}]] = \lambda P\lambda x[P(x) \wedge m_c(x) \geq r_c]$

$[[po\text{-}]] = \lambda P\lambda x[P(x) \wedge m_c(x) \leq s_c]$

'rc', 'sc': contextually determined expectation (e.g., positive integer).

[72] Why is this?

It probably follows from the requirement that a measure prefix can only apply to an interval on an open scale that refers to a degree of change (that was brought up by the event).

So, what happens when *na-* combines with a verb providing a scale of quantity (of objects)?

Since the verbs serving as the input for *na-* are always homogeneous – there is no interval delimited on the relevant scale yet – *na-* applies to the scale and delimits a relatively large interval on it. By this – i.e. by delimiting/measuring the difference value/degree of change – the event itself gets delimited.

This can be demonstrated using the example from the section title: *nanosit židle* (na-bring chairs). The direct object *židle* provides a scale of quantity. *Na-* applies to it and delimits an interval on it – which is equal to saying that the chairs were (relatively) many. Delimiting the quantity of the chairs leads to delimiting the event of bringing/gathering many chairs.

As for the few cases when *na-* quantifies over a singular count DP and gives rise to the iterative interpretation (e.g. *na-stříhat papír* (*na proužky*) na-cut paper (into strips)), I would argue that it is not necessary to propose a completely different analysis to capture the facts. One can argue that *na-* indeed does quantify over the DP in the direct object position and not over the event directly, which would intuitively seem to be the case (cf. the examples in 2.1.4.). One can do that by saying that *na-* quantifies over different stages (in Carlsonian sense) of the direct object argument. Essentially, the effect would be that there were many (more than few) different stages of the sheet of paper that was cut into strips. This is in effect equal to saying that there were more events of cutting the same sheet of paper into strips but allows us to have essentially the same analysis for all *na*-verbs taking accusative DPs.

One cannot say **navařit bramboru* (na-cook potato.sg) because there is no possible meaning for it. It cannot mean 'cook/boil a big potato', since potatoes do not grow by cooking (*na-* could not be said to measure the degree of change here); nor can it mean 'cook/boil a potato to a large degree', since a scale of readiness is not open – see 4.5.2.

Navařit brambory (na-cook potatoes) is grammatical but only under the reading 'cook/prepare lots of potatoes'; the readings 'cook/boil big potatoes' or 'cook/boil the potatoes to a large degree' are not available, just like in the case of **navařit bramboru*.

The difference would be that in the case when the direct object is a singular count noun, the scale associated with it and the one *na-* would apply to would be a scale of quantity of distinct stages (of the same object), not of distinct objects.

Since every stage corresponds to one subevent of the iterated event, delimiting the number of stages (by *na-*) leads to delimiting the number of subevents, which in turn leads to delimiting the iterated event.

4.4.2. Type *nachodit se* (reflexive *na*-verbs/'incremental experience' verbs – section 2.1.2.)

Let us repeat one example of a reflexive *na*-verb ((8f)):

(75)   To   jsem   se ale   na-chodil!
         EMPH AUX.1.sg REFL EMPH na-walked
         'So much I have walked!'

This class of verbs differs from the previous one not by a different form of the verbs themselves but rather by a different semantics, which is caused by the (obligatory) presence of the reflexive. The reflexive in the structural accusative case position introduces a scale consisting of various degrees to which one perceives the amount of experiencing something as sufficient (scale of 'incremental experience').

Na- applies to this scale and delimits a relatively large interval on the scale – the endpoint corresponds to the state when one feels satiated with a given activity.

By measuring/delimiting an interval on the scale of 'incremental experience', the event itself gets delimited.

Let us use e.g. *na-chodit se* (na-walk REFL) as an illustration. Suppose that *se* introduces a scale of experience and *na-* creates a relatively/sufficiently large interval on the scale. This gives rise to the meaning that someone has experienced a given activity to a sufficient degree. Since an event of 'incremental experience' is delimited by delimiting the amount of experiencing something (= by delimiting an interval on the scale of experience), *na-chodit se* refers to a delimited event.

4.4.3. Type *povyrůst* (low degree *po*-verbs/degree achievements – section 2.2.3.)

This is the type of verb most easily understood as containing some sort of scale in their semantic representation (e.g. (38a), repeated here):

(76)   Tulipány po-vadly
         tulips po-withered
         'The tulips withered a bit'

Many of these verbs are deadjectival (*po-smutnět* po-grow.sad, *po-blednout* po-get.pale, *po-hubnout* po-get.thin/lose.weight); in these cases, it is quite clear that the relevant scale is the one associated with the property denoted by the adjectival base. But also verbs that are not derived from adjectives can be easily associated with a scale corresponding to a property (often expressible by an adjective). For example, *po-vyrůst* (po-grow.up) can be associated with a scale of height, *po-vadnout* (po-wither) with a scale of witheredness/wiltedness etc.

Since these verbs are the ones that are delimited when the degree of change in some property is delimited, *po-*, when combining with a homogeneous predicate (e.g. *po-vadnout* po-wither, *po-blednout* po-get.pale), delimits the event described by a low degree *po*-verb by delimiting an interval on a scale of the property being changed. This is done by measuring the interval/saying that the interval is relatively small.

When *po-* combines with a quantized predicate (*po-vy-růst* po-(up-grow^P), *po-z-měnit* po-(change^P)), it measures the interval already delimited (on the relevant scale) – but it does not delimit the event again (assuming that double delimitation is not possible).

So, here we have the case when the prefix is underspecified as to whether it applies to homogeneous or quantized predicates. The role of the prefix – to measure intervals on scales – is the same in both cases; the only difference is that applying a measure to a scale without any delimited interval on it leads to its creation/delimitation. Measuring and delimiting are just two sides of the same coin in this case. On the other hand, measuring an interval that is already

delimited (that already exists) simply does not lead to anything else - no additional delimitation, no creation of a new interval takes place; the interval is simply measured and that is all.

I see these two processes, i.e. measuring something non-delimited (which leads to the delimitation of the thing) and measuring something delimited as absolutely natural and intuitively clear options. I take this intuition to support my claim that it is not anything in the nature of measure functions that prohibits the application of particular (types of) measure expressions to quantized predicates. Rather these constraints have to follow from something else.

4.4.4. __Type *povyjet* (short distance *po*-verbs/directed motion verbs – section 2.2.2.)__

The class of verbs that can be exemplified by the following sentence (the original example (32a))

(77)   Řidič trochu po-po-jel, aby nám nestál v cestě

           driver a bit po-po-drove so-that us not-stood in way

           'The driver moved on a bit so that he didn't stand in our way'

is just like the previous one, except that these verbs introduce a scale of progress along a path and not a scale of a property. However, *po-* can apply both to delimited/quantized predicates as well as to homogeneous ones, just like in case of low degree *po*-verbs, which is totally expected since it is in principle an option for *po-*.

So, *po-* either delimits the path that is traversed by one of the verb's arguments (by measuring it) (*po-po-jet* po-po-drive, *po-po-letět* po-po-fly) or it simply specifies that the path already delimited is relatively short (*po-skočit* po-(jump^P), *po-vy-jet* po-(out-drive^P)).[73]

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[73] This presupposes that in cases like *po-po-jet*, *po-po-letět*, the predicates the delimitative *po*-combines with are homogeneous. This is, however not that clear (see the discussion in 2.2.2.). If I accepted the other view I would simply take the latter case (when *po-* measures an already delimited interval) to be the only option.

As for the impossibility of *po-při-skočit (po-to-jump (once)), as opposed to well-formedness of po-od-skočit (po-from-jump (once)), see 4.5.

4.4.5. <u>Type *popřemýšlet* (short time *po*-verbs/simple activity verbs – section 2.2.1.)</u>

An example like (28a), repeated here:

(78)   Jakub o tom po-přemýšlel
         Jakub about it po-thought
         'Jakub thought about it for a little while'

represents the class of verbs that causes the most trouble.

It is the only class of verbs prefixed by a measure prefix that combines with durative adverbials and not time-span adverbials. It is also the class of verbs that sometimes require the dative reflexive *si* to be grammatical.

I am not able to say anything sensible about the latter fact but, as for the first one, I hope it can be explained in terms of what *po-* applies to in this class of verbs.

So, let us look at what *po-* does here.

Since simple activity verbs provide no other scale for delimiting an event than a scale of duration (they cannot be delimited by anything other than time, since these predicates are so simple – they do not refer to any other change than the change in time), *po-* applies to this scale and delimits a relatively short interval on it.

Now, why this is not an option for other kinds of *po-* and *na*-verbs, since all of them presumably have temporal duration (= contain a scale of temporal duration), has already been discussed (4.3.3.): the other classes of verbs describe events that are/can be defined by other kinds of change than pure change in time. The fact that these events take a certain amount of time is a simple consequence of the real-world fact that events happen/develop in time.

As for the verbs like *spát* 'sleep', *sedět* 'sit', *chodit* 'walk (non-directed)' there is simply no other choice, no other scale that could serve as a possible input for *po-*, i.e. no other scale whose delimitation would cause the delimitation of the event.

But why is it that *po-* can never combine with a verb like *nenávidět* 'hate', *věřit* 'believe' or *vědět* 'know'?

The relevant distinction between the verbs like *know*, *believe*, *hate* on one hand and *sleep*, *sit*, *stand*, *lie* on the other hand is the distinction between 'state verbs' and 'statives' (Jäger 2001, referring to the 2000 paper by Maienborn). This distinction can be diagnosed – in English – by the im-/possibility of forming progressives: state verbs do form progressives (*I am sleeping / sitting / standing...*) whereas statives do not (??*I am knowing / believing / hating...*).
Jäger (2001) subsumes state verbs, activities, accomplishments and achievements under the heading 'eventive'. He reports that Maienborn proposes that non-stative predicates (including state verbs) have a full-blown event argument while statives only have a temporal argument. Jäger argues against this analysis, suggesting that all predicates have a Davidsonian (event) argument – the difference between eventive and stative predicates being that the Davidsonian argument of statives is of different sort than events proper.

Whatever the right account of the distinction is, it is the one that sets apart predicates that do combine with *po-* from those that do not.
If I accepted Maienborn's view there would be no need to modify anything in my proposal – I would just identify the *e* argument in (73a) with 'eventive' eventualities. The 'stative' ones would be excluded because they do not have any *e* variable in their semantics.
If I accepted Jäger's proposal, I would either specify that the *e* argument in (73a) has to be of the right type (e.g. e_e), or else I would modify the semantics of the prefixes (or at least *po-*) in the following way:

(79)   [[measure prefix]] = $\lambda P_e \lambda x[P_e(x) \wedge m(x) = c]$

where P_e is an eventive predicate

I would be inclined to capture the facts by saying that the *e* argument in (73a) has to refer to a non-stative eventuality but nothing really hinges on a particular way of stating the condition.

Now, there is another question: why is it that *po-* can only apply to homogeneous predicates here while it has the other option, too, with the other classes of *po-*verbs?

My answer is:

Po-, when applying to a quantized predicate, has to apply to an already delimited interval on the scale that defines that type of event. Now, while there are classes of verbs where prefixation/perfectivization leads to the delimitation of a path, incremental theme or degree of change (these then serve as inputs for *po-*), there are presumably no verbs (non-phrasal predicates) that are delimited purely by imposing boundaries on the temporal duration. (The fact that time is always delimited is just a consequence of having delimited an event (by delimiting some other kind of scale).)

To be more precise: there are no such verbs other than 'short time' *po-*verbs (and perhaps also few other classes of verbs prefixed by measure prefixes: *za-*verbs[74]).

Po-, in short time *po-*verbs, delimits the temporal duration by specifying its length; there is no other way to delimit time intervals (in Czech), there is no prefix saying that the time interval is delimited without saying how long it is at the same time. Hence, there is no case when *po-* could attach to a delimited (but not measured) interval on a temporal scale. Applying a measure prefix to the same predicate twice clearly does not make sense.

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[74]Here are some of the verbs prefixed by *za-*, a prefix having a very similar meaning as delimitative *po-*: *za-lyžovat si* (za-ski REFL), *za-jezdit si* (za-ride REFL), *za-bruslit si* (za-skate REFL). Since presumably all the verbs in this class take the dative reflexive obligatorily, the construction gets the interpretation 'to do and enjoy an activity for some time'.

This class of verbs is just like 'short while' *po-*verbs with respect to their (in)compatibility with durative / time-span adverbial (which is discussed in 4.6.2.) .

A path or degree, on the other hand, can be delimited without explicit reference to its size – it is enough to specify a direction of the path (e.g. *vy-jet*: **out**-drive) or the change (*vy-růst*: **up**-grow) together with stating that the path/change is bounded (via [+pf]). Then, it follows that these verbs are possible inputs for *po-*.

This section concludes the core part of my proposal.

In the following sections, I look at some more properties of *po-* and *na-* and the *po-* and *na-*verbs, namely those connected to more general problems of measurement, delimitation and telicity.

4.5. <u>Directional and measurement prefixes</u>

In what follows, I try to explain Filip's data like *po-od-skočit* vs. **po-při-skočit*, i.e. to say why certain combinations of directional and measurement prefixes are possible (*po-* + Source prefixes) whereas other are not (*po-* + Goal prefixes). In doing so I rely on what Zwarts (1997), Zwarts and Winter (2000) and Winter (2001) say about modification of locative prepositions.

4.5.1. <u>Zwarts (1997), Zwarts and Winter (2000), Winter (2001)</u>

Zwarts (1997), Zwarts and Winter (2000), Winter (2001) develop a model which they call *vector space semantics*. Zwarts (1997) then uses it as a basis for a compositional semantics of modified locative PPs; Zwarts and Winter (2000) refine and extend the proposal. Winter (2001) extends the analysis even further: he proposes a unified account for measure modification of locative prepositions, adjectives and comparatives.

Zwarts (1997), searching for a compositional semantics for modified locative PPs, suggests that a locative PP be a set of vectors, rather than a set of points (as in preceding proposals). Modifiers, then, map a set of vectors to a subset.

Let us take, for example, a PP like *two centimeters above the door*. The PP *above the door* can be modeled as a set of vectors starting at (the upper edge of) the door, pointing up. What the modifier does is pick out only those vectors that are two centimeter long. Then, the modified PP *two centimeters above the door*

denotes a set of two centimeters long vectors pointing upward from the door. The result is nice – compositional and intuitively plausible.

Moreover, in this model, one is able to define natural classes of locative PPs with a characteristic semantic behavior.

The regions (sets of vectors) denoted by locative PPs have certain formal properties. One example of such a property is closure under lengthening:

(80)   *Closure under lengthening*

A region R is closed under lengthening iff

for every non-zero $\mathbf{v} \in R$, $s\mathbf{v} \in R$ for every $s > 1$[75].

   (Zwarts 1997, p.35)

If a vector is in a region that is closed under lengthening, it can be lengthened and will still remain in the region. Imagine a region denoted by the PP *above the door*. Whatever the length of a vector in that region is (all vectors in the denotation of this PP start at the door and point upward), one can make the vector even longer – it will remain in the region denoted by the PP *above the door*. Regions closed under lengthening are, obviously, unbounded in the direction in which the vectors point. In contrast, regions that are not closed under lengthening are bounded.[76]

This criterion (closure under lengthening) gives rise to a natural class of prepositions (PPs) (like *in front of*, *behind*, *under*, *outside*…(NP)); it distinguishes them from prepositions (PPs) which do not meet the criterion (*on*, *between*…(NP)).

What PPs closed under lengthening have in common is that they can be modified by measure phrases, unlike PPs that are not closed under lengthening:

(81)   two meters behind / above / under /outside … NP

---

[75] v – vector, s – scalar; vectors can be multiplied by scalars; if the scalar is greater than 1, the vector will be lengthened, if it is between 0 and 1, it will be shortened.

[76] All simple PPs are closed under shortening. (Zwarts 1997, Zwarts and Winter 2000). Since this property does not vary within (simple) PPs, it is ignored in determining when the measure modification is possible.

vs.

*two meters between / near / on / inside… NP

(82)   "The intuitive explanation is that measure phrases specify a value or range of values on an open-ended scale and the regions that are closed under lengthening are the regions that provide such a scale."

(p.37)

Zwarts and Winter (2000) make use of the notion of vector *monotonicity*, rather than speaking of closure properties, when describing the possibility of measure modification. (I take these two ways of capturing the facts to be equivalent.) "Intuitively, vector monotonicity corresponds to truth preservation when the located object gets further from/closer to the reference object"(p.187).[77]

I.e. if something is *above the house*, it is above the house also when it gets higher/further from the house as well as lower/closer to the house.

Zwarts and Winter (2000) suggest that "[v]ector monotonicity is relevant to the grammaticality of PP modification" (p.189). Since all simple locative prepositions are VMON↓ (downward vector-monotone), what makes the difference is whether the set of vectors being modified are also VMON↑ (upward vector-monotone).

Zwarts and Winter then ask: "[w]hy does vector monotonicity affect the acceptability of measure phrase modification?" The answer is: "we assume that certain grammaticality phenomena are affected by the motivation to avoid semantic trivialities like tautology or contradiction. In the case of PP

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[77] For purposes of the present thesis, this informal characterization of vector monotonicity suffices. VMON↑ corresponds to truth preservation when the located object gets *further* from the reference object; VMON↓ covers the cases in which the truth value is preserved when the located object gets *closer* to the reference object. For the definition of vector monotonicity, see Zwarts and Winter (2000, p. 187).

modification, the modified PP has to guarantee that any non-trivial measure phrase modifying it would not lead to an empty set"[78] (p.190).

So, this is why a PP has to be both VMON↓ and VMON↑. If a set of vectors denoted by a PP were not both VMON↓ and VMON↑, there would be vectors of certain length that would be missing from the denotation of the PP – and these 'gaps' would then cause that intersection with vectors of some *measure sets* (of exactly those lengths which are missing in the denotation of the PP) to lead to an empty set.

This is essentially the analysis that can be found already in Zwarts (1997) – stated in slightly different terms.

However, Zwarts and Winter (2000) touch upon a topic of *directional* prepositions as well – this is where this later paper is getting closer to the present problem.

They argue that it is not appropriate to use vectors directly in the semantics of directional prepositions, although, at first sight, it might seem plausible to represent the movement of an object with a vector connecting the starting point with the endpoint of the movement. Directional prepositions – describing a *change* in location (as opposed to locative prepositions, which describe a *static* position of the located object) – can also make use of vectors: they would represent the subsequent locations of an object. However, the route itself should be denoted by a more complex object – a *path*. A path would be a set of *sequences of vectors* (Zwarts and Winter, 2000, p.202)

Winter (2001) generalizes the modification condition[79] of Zwarts (1997) and Zwarts and Winter (2000). He uses vectors (VSS – vector space semantics) to

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[78] The semantics of a modified PP is computed like this: the denotation of the PP (a set of vectors starting from the same object) is intersected with the denotation of the modifier (a set of vectors of certain length).

[79] "The modification condition of Zwarts/Winter requires that in order for a set of vectors to be modified by an MP [measure phrase] it has to include vectors of all possible lengths. This happens whenever the set that is being modified is both upward and downward *monotone*" (Winter 2001, p. 608).

account for the semantics of degree adjectives and comparatives – with an explicit reference to the similarity of his approach to the interval semantics proposed by Kennedy (2000).

Winter defines the notion of *scale* using vectors: a scale is basically a set of vectors. ("A scale is defined using a unit vector and a set of real values" (p.613.)) Degree adjectives/comparatives are treated as denoting sets of vectors (= scales). The modification condition is then defined with respect to the sets of vectors (instead with respect to vectors):

(83) **Definition 7 (modification condition)** *A set of vectors $W \subseteq V$ satisfies MC iff it is non-empty and for every non-empty measure set M: $M \cap W$ is not empty.*

It is easy to verify that a set of vectors satisfies MC if and only if it is non-empty and both upward and downward monotone.

(p.618)

To sum up, Winter (2001) has generalized the modification condition in such a way that is directly compatible with the scalar approach. In the following subsection I am going to restate the modification condition in a framework using scales without any reference to vectors and I am going to use this modified modification condition for explaining the problematic data *po-od-skočit* vs. **po-při-skočit* etc.

4.5.2. <u>Modification condition defined with respect to the properties of scales</u>
Since I take a scale to be a set of points, rather than a set of vectors,[80] I have to restate Winter's (2001) modification condition a bit. In doing so, I rely on a

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[80] Which is in fact equivalent if a vector unambiguously determines a point (its endpoint). Here, I adopt the view of scales without any reference to vectors not because I think it is generally more appropriate, but because I do not need to refer to vectors, so, I take the easier way. From the same reason, I take a scale to be a set of point rather than a set of intervals (cf. Schwarzschild and Wilkinson, 1999).

typology of scales introduced in Kennedy and McNally (2002), discussed here in subsection 4.2.1.; i.e. what is important is whether a scale is open or closed:

(84)   Measure expressions (measure phrases, prefixes) can only apply to open scales

By *open scale*, I mean a scale that is open in the relevant direction[81] – in the direction in which the values increase.

4.5.3. *po-od-skočit* vs. **po-při-skočit*

I believe that the contrast between the compatibility of *po-* (a measure prefix) with source prefixes and its incompatibility with goal prefixes can be explained in terms of properties of scales associated with the verbs prefixed by source/goal prefixes. Namely, it seems plausible to view verbs with source prefixes as associated with open scales, since the path they introduce is only bounded at the lower end – they only specify the source of the movement. Verbs prefixed by goal prefixes, on the other hand, do specify the upper endpoint and hence are not possible inputs for measure modification.

It is necessary to stress that I distinguish between closed scales and scales with (delimited) intervals on them. Delimited predicates are associated with scales containing delimited intervals; non-delimited predicates are associated with scales that have no such intervals[82]. However, the scales that are associated with both delimited and non-delimited predicates can be either open or closed.

(85)
a) non-delimited predicate

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[81] It is not important whether the scale relevant for the delimitation status of the event corresponds to a positive or negative adjective (in cases of degree achievement *po*-verbs where the property is describable by an adjective), since the prefixes always measure "differential degrees" and these are like positive degrees. The situation is comparable to the one with comparatives: one cannot say **21 pages short* (only *21 pages long*) but *21 pages shorter* is just as good as *21 pages longer* and it (see e.g. Kennedy, 2000, p.41-45, for the discussion on measure phrases and comparatives).

[82] More precisely, non-delimited predicates correspond to intervals stretching to infinity: $(0, \infty)$.

open scale

b) delimited predicate
open scale

c) non-delimited predicate
closed scale

d) delimited predicate
closed scale
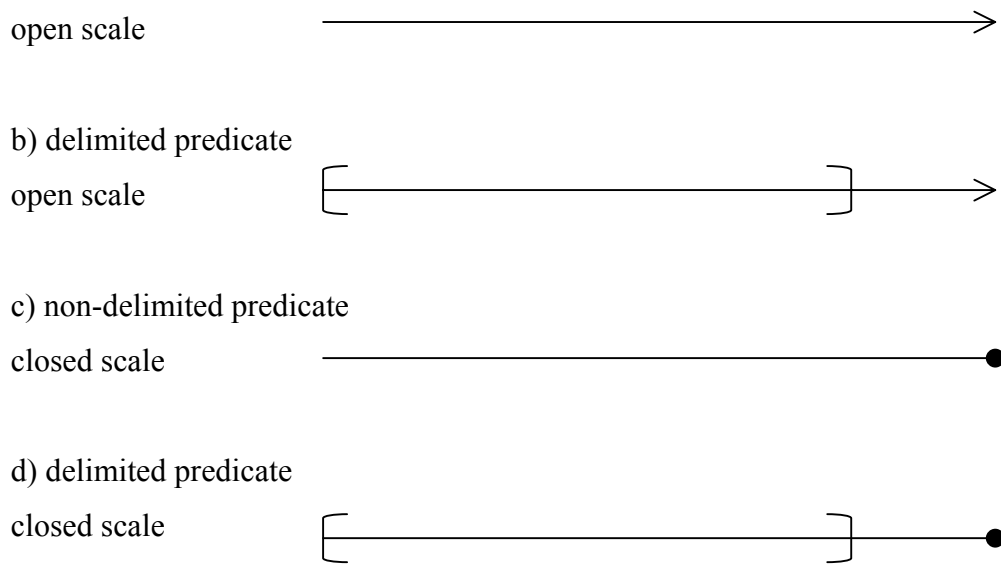
(I am saying nothing about the initial points/lower endpoints of the scales. In fact, I assume that these scales have lower endpoints, corresponding to the initial points of the eventualities described – these are also the initial points for measuring.)

I take *od-skočit* to correspond to (85b) and *při-skočit* to (86):

(86)
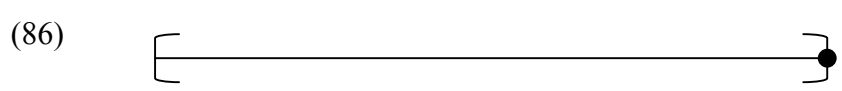
which I take to be a special case of (85d) (see section 4.6. for the discussion).

Od-skočit, then, being associated with an open scale, can be modified by a measure expression (a measure prefix), whereas *při-skočit*, being associated with a closed scale, cannot.

Skočit would be just like *od-skočit*; the only difference being that *od-skočit* makes explicit reference to the source/initial point of the movement (and by that, its direction). Hence, the possibility of *po-skočit*.

I illustrated the point with *od-skočit* and *při-skočit*, but I assume the same holds for all verbs prefixed by source and goal prefixes. Goal prefixes, specifying the

endpoint of the path (scale), make the scale a verb is associated with closed, hence, an impossible input for measure expressions.

4.5.4. <u>Potential problem</u>

However, things are probably more complex than this.

I would expect this analysis to extend also to cases when the endpoint of a path is not expressed by a prefix but rather by a directional PP. Nevertheless, once we leave the domain of words and get to the phrasal level, the data get more complicated.

(87)   Skočil *metr*   **k**   **oknu**

jumped.P meter toward/(??to)[83] window

'He jumped a meter towards the window'

is not necessarily a counterexample (*k oknu* providing the endpoint of the scale and *metr* being a measure phrase), since *k* means rather 'toward' than 'to' here. What is more puzzling, though, is that some speakers[84] accept sentences like:

(88)   (??)**Při**-skočil *metr* **k oknu**

to-jumped meter to window

'He jumped a meter to the window'

The fact that the goal prefix cooccurs with the goal PP is not problematic – they both refer to the same endpoint: *při-* specifying that there is such an endpoint, *k oknu* identifying the endpoint with a window.

For me, *k* cannot mean 'toward' here because the PP has to agree in its meaning with the prefix and the prefix can only mean '(all the way) to' in *při-skočit*[85].

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[83] *Skočil k oknu*, without a measure phrase, *can* mean 'jump (all the way) to the window' (it is the most natural interpretation, in fact).

[84] Not me, though. I rather agree with Filip's judgments (Filip, 2004).

[85] I cannot successfully use *Petr přiskočil k oknu* if the jumper did not end up being at/by the window in the end. This is not a general rule for *při-*, though, since *při-blížit se* means 'get closer to' (and usually not 'get all the way to (some place)').

However, there are speakers who accept (88) with the preposition meaning 'to' and there are also speakers interpreting *k* as 'toward'. In fact, for yet other speakers *k* is perhaps just vague and can mean both.

For different speakers, a path for measuring (provided by *k*) is different. For some of them, it is the distance between the original point and the window, for others, it is the distance from the original point to the endpoint, which is different from the window and yet for other speakers it is the distance between the endpoint of jumping and the window.

As for (88), the intuitions different speakers have are so diverse and confusing[86] that I cannot do anything else than follow my own intuition – i.e. exclude the sentence as ungrammatical or at least very odd.

There are, however, other cases where the endpoint is specified but still the predicate can be modified by a measure phrase:

(89)   Běžel 2 km do krámu
         ran[I] 2 km to the store
         'He ran 2 km to the store'

which sounds quite natural and perfect when modified like this (when the 2 km are salient in the discourse):

(90)   Ty 2 km do krámu uběhl rychle
         the 2 km to the store ran[P] fast
         'He ran the 2 km to the store fast'

In both (89) and (90), 2 km refer to the distance between the original point and the store.[87]

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[86] I doubt this could be a dialectological difference; rather, the intuition about data like these is unclear.

[87] (89) can also have the meaning – at least for some speakers – 'he ran 2 km with the intention to get to the store which never happened' (this is due to the imperfectivity of the verb) – the continuation could be something like *ale nedoběhl tam, protože si po cestě zlomil nohu* (but he didn't get there because he broke his leg). Then, however *do* means rather 'toward' than 'to', hence, (89) in this meaning does not pose a problem.

However, as for these cases, I could perhaps adopt Rothstein's solution as described in Filip (2004), namely I could claim that (*the*) *2 km to the store* is a single syntactic and semantic constituent and avoid the problem this way. (This seems to be a good solution for (90); whether this can work for (89) is less clear, though.)

Trying to solve these and related problems would lead me too far from the original topic of the present thesis – this is just to sketch a potential problem for my analysis of *po-od-skočit* and **po-při-skočit*. However, I believe that the account proposed in 4.5. (following Zwarts (1997), Zwarts and Winter (2000) and Winter (2001)), is essentially right and that the potential counterexamples could be explained in some plausible way.

In the following subsection, I describe and try to solve another problem potentially challenging my analysis.

4.5.5. <u>Testing (84) against *na-* and *po*-verbs</u>

Now, once having accepted and reformulated the modification condition of Winter (2001), following Zwarts (1997) and Zwarts and Winter (2000), it is necessary to look back at our data and test the hypothesis against them. In other words, is it true that all *po-* and *na*-verbs are associated with open scales?

As for the *na*-verbs, this seems to be true; *na-* measures either over a scale of quantity (cardinality), which is clearly infinite, or over a scale of experiencing, which can also in principle extend to infinity.

What about the *po*-verbs?
As for the 'short time' po-verbs, there is no threat for (MC) – a temporal scale has no boundaries.
More interesting are the last two classes of verbs in question: 'short distance' *po*-verbs and 'low degree' *po*-verbs.

Looking at the 'short distance' *po*-verbs first, i.e. the directed motion verbs, we can see that the scale associated with them, the one corresponding to progress along a path, can potentially be either open or closed. As we have seen in 4.5.3., the verbs prefixed by goal prefixes are associated with closed scales, whereas the verbs prefixed by source prefixes (or the unprefixed verbs) are associated with open scales. The acceptability of *po-vy-lézt* (po-out-crawl), *po-ode-jít* (po-from-go), *po-vy-táhnout* (po-out-drag/pull), *po-od-skočit* (po-from-jump) and the unacceptability of **po-při-lézt* (po-to-crawl), **po-při-jít* (po-to-go), **po-při-táhnout* (po-to-drag/pull), **po-při-skočit* (po-to-jump) confirms (in fact gave rise to) the hypothesis.

Now, let us look at the 'low degree' *po*-verbs – the degree achievements. These verbs are associated with scales of various properties. Different properties may correspond to different types of scales. To test whether a particular scale is closed or open, we may try to use the diagnostics in Kennedy and McNally (2002), i.e. the compatibility of the adjectives (denoting the relevant properties) with modifiers like *absolutely*, *completely*.

Here is a list of all degree achievements combining with *po*- I can think of. In the cases when the property underlying a particular scale is expressible by an (underived) adjective (deadjectival verbs), the verbs are introduced together with the name of the property and the demonstration of the (im)possibility of modification by *úplně* 'completely':

(91)
(a) <u>deadjectival</u> :
po-hubnout (po-get.thin) – hubený,?úplně hubený[88]
po-smutnět (po-grow.sad) –smutný, ??úplně smutný
po-temnět (po-grow.dark) – temný, úplně temný
po-blednout (po-get.pale) – bledý, **úplně bledý**

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[88] *Úplně hubený* does not sound completely out. However, it is clearer than with *poblednout* that here, *completely* means rather something like *very*. Actually, also *úplně temný* and *úplně bledý* may be the same cases, it is just harder to decide (see also next footnote).

(b) <u>deverbal</u>:

<u>intransitive</u>: po-vadnout (po-wither), po-vy-růst (po-up-grow), po-u-smát se (po-smile REFL), po-o-křát (po-pick.up.again), **?po-roz-tát** (po-melt)

<u>transitive</u>: po-změnit (po-change), po-o/u-pravit (po-correct), po-od-krýt (po-un-cover), po-o-točit (po-turn), **po-ote-vřít** (po-open)

(and few synonyms)

According to the diagnostics, *blednout* ('get pale') (and *temnět* 'grow dark') should be associated with a closed scale; hence, it would seem that the measure modification should be excluded. Nonetheless, this is not the case: *po-blednout* (and *po-temnět*) is perfectly well-formed.

However, first: if we suppose that *bledý* (pale) is a negative adjective with a positive counterpart *temný* (dark; both presumably corresponding to the same scale – e.g. Kennedy, 2000) and if we suppose that in *po-bledno*ut (just like in *po-temnět*), *po-* measures a difference value (an interval between the initial and final degree of paleness/darkness), i.e. an interval going in the positive direction (just like in comparatives – cf. footnote 81), then the only thing that matters is whether the scale is open at the upper end − at the end corresponding to the highest degrees of darkness.

Moreover, it is not quite clear what the *completely*/*absolutely* diagnostic really tests.

Rotstein and Winter (2003) seem to use essentially the same diagnostics (the compatibility with *completely*) to test something slightly different. In their analysis, *completely* seems to require that there be a definite 'standard value of completeness' (d_c) for a given adjective. The standard value of completeness may be different from the maximal point of a scale.[89] I find Rotstein and Winter's (2003) approach better, since it captures the fact that one may say:

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[89] Rotstein and Winter (2003) comment on Kennedy and McNally's (2002) discussion of *completely*. They say that *completely* does refer to an endpoint – when the adjective is total; in that, Kennedy and McNally's account agrees with their own. However, this captures only one meaning of *completely*, the one that is only compatible with total adjectives (adjectives like *clean*,

(92)   The shirt is completely dirty but the pants are even dirtier.

Similarly, it is perfectly fine to say:

(93a)   Tenhle kluk je úplně bledý, ale tenhle je ještě bledší.
         this   boy is completely pale but that is even paler
         'This boy is completely pale but that one is even paler'
or

(93b)   Tamhle je to nebe úplně temné, ale tamhle je ještě temnější.
         there   is the sky completely dark but there is even darker
         'There, the sky is completely dark, but over there, it is even darker'

This seems to show that *úplně* does not identify a maximal point of a scale;[90] hence, lacking other diagnostics, I conclude that *bledý*/*temný* might in fact correspond to a scale open on both ends.

As for deverbal degree achievement verbs, it is even less clear how to decide whether the underlying scales are closed or open. These verbs are usually associated with properties that can be described by deverbal adjectives but these are probably different from underived adjectives.

Adjectives derived from the verbs in (91b) (participles) are predicted to be associated with totally closed scales, since they are derived from delimited/telic

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complete, *safe*, *healthy*, as opposed to *dirty*, *incomplete*, *dangerous*, *sick*, which are called partial adjectives). The other meaning is more like that of *very*, as in *The story is completely boring*; it is usually the only meaning one gets when modifying partial adjectives by *completely* (Rotstein and Winter 2003, footnote 18). This seems to suggest that, as for *bledý* (pale), *completely* is not supposed to refer to the end of the scale, since if *bledý* is analyzable as any of the pair total – partial, it is rather a partial adjective, i.e. the one without a maximal point, under Rotstein and Winter's (2003) hypothesis.

[90] Or else, *úplně* does identify the maximal point of a scale but this maximal point may be context dependent and, hence, overridden easily in a new context. .

verbs (Kennedy and McNally 1999, 2002). These adjectives, since they are in fact *derived* from verbs, may be considered not the ones referring to the scales *underlying* the verbs in (91b).

Nevertheless, at least intuitively, *po-roz-tát* (po-melt) and *po-ote-vřít* (po-open) seem to be associated with closed scales since nothing can melt further when it is already completely melted and similarly, one cannot open a door more when it is already completely open.

To sum up, these verbs may constitute counterexamples to (84). However, since I have no reliable test for open/closed scales, all I can say is that: *po-roz-tát* and *po-ote-vřít* as well as *po-blednout* and *po-temnět* may be counterexamples to (84) but so far, the conclusion cannot be definite.

4.6. <u>Telicity and delimitation</u>

So far, I have been using the notions *telic*, *delimited*, *quantized*, *bounded* without being explicit about what I mean by them. Now, I want to separate telicity from the other notions, which I take to be roughly equivalent – and define them with respect to the scalar properties of predicates.

4.6.1. <u>Defining the notions</u>

I am using the notions of telicity and delimitation[91] in the following way:

As used here, telicity is a narrower notion than delimitation – the set of telic predicates is a proper subset of the set of delimited predicates.

A *delimited* (verbal) predicate has temporal boundaries, which are expressed either directly (as in *he slept **for 2 hours**, he slept **from 2 to 4***) or by mapping between events and their temporal traces/scales of temporal duration (*he ate **3 apples**, he ran **2 km***).

A *telic* predicate has – and reaches – an *internal*[92] endpoint: *he ran **2 km**, he built **a house*** are telic predicates because the events they describe are over once the

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[91] I am going to use the term *delimitation* as a cover term for all the remaining notions: i.e. also *boundedness* and *quantizedness*, even though for different linguists these might mean different things.

[92] I am aware of the fact that *internal endpoint* is a very vague notion.

two kilometers are run or once the house is built – the endpoint is specified within the predicates and it is reached at the end of the event. *He slept **from 2 to 4*** is not a telic predicate because the temporal delimitation is not internal to the predicate; it is imposed on it from outside.

In terms of the scalar structure of the predicates, the difference between telic and delimited predicates[93] can be stated as follows:

1. <u>When the scale associated with a predicate is closed</u>
Telic predicates can be modeled using a diagram in (86), repeated here:

(94)
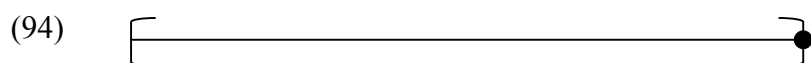
In words, when a telic predicate is associated with a closed scale, there has to be an interval on it stretching from the lower endpoint to the upper endpoint – *including* the upper endpoint. This upper endpoint is the internal endpoint of an event in this case.


Internal is presumably every endpoint other than purely temporally specified (see further). Perhaps, it could be defined e.g. as an endpoint on a scale provided VP internally – if we take adjuncts like *enough* to be VP internal. Cf. the following interesting contrast:

(i)   Půl hodiny / ?za půl hodiny jsme   si   za-skákali na trampolíně
         half hour / in half hour   AUX.1.pl REFL za-jumped on trampoline

(ii)   Za půl hodiny / *půl hodiny jsme   si   za-skákali na trampolíně **dostatečně**
         in half hour / *half hour   AUX.1.pl REFL za-jumped on trampoline **enough**

That the 'in an hour' test is a test for internal endpoints/telicity is discussed a bit further. (Verbs with 'delimitative' *za-* are similar to 'short time' *po*-verbs (see footnote 74); they are e.g. generally incompatible with time-span adverbials, just as 'short time' *po*-verbs are (see 4.6.2.)).

[93] All the discussion concerning a/telic and non-/delimited predicates applies only to those predicates whose telicity is computed on the basis of their scalar structure, the predicates of gradual change. There is probably also lexically encoded telicity, which I do not discuss at all.

A *delimited* predicate, when associated with a closed scale, describes an event associated with an interval on the scale as introduced in (85d), repeated here:

(95)

⊏――――――――――⊐――――●
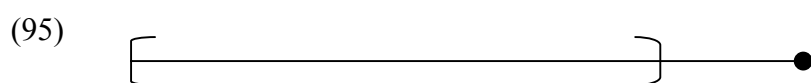
((94) and (95) are exemplified below.)

A predicate is delimited if it corresponds to a delimited interval on the relevant scale. An interval is delimited when it does not stretch to infinity.
A case when the interval stretches to the very end of a closed scale (94), i.e. when it is telic, is a special case of a delimited predicate.

It is important to stress that the presence of an endpoint on the scale by itself is not enough to make a predicate telic. Such a maximal point of a scale serves as an internal endpoint of an event but it is only an endpoint of an event if it is reached (at the end of the event). In other words, the black dot means that a scale is closed and telicity is inclusion of the black dot within the delimitation/delimited interval (more precisely, the black dot forms the upper bound of it).
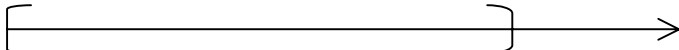
To give concrete examples of predicates associated with the scales in (94-95): *to close the door* or *zavřít dveře* corresponds to (94), *to be closing the door for 6 seconds* or *zavírat dveře 6 sekund* to (95)[94]. (94) and (95) have the same closed scale (with the same upper endpoint – the point when the door is closed) but only the event described by (94) reaches this endpoint; hence, only (94) is telic.

2. <u>When the scale associated with a predicate is open</u>
A delimited predicate associated with an open scale looks like this:

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[94] Strictly speaking, *6 sekund* does not directly delimit an interval on the scale in (94). I presuppose that *6 sekund* delimits an interval on a scale of temporal duration and this interval then is mapped onto the scale associated with the event.

(96)

A delimited predicate is associated with a delimited interval on an open scale.

So, what is the difference between a telic predicate and an atelic predicate here?

Here, I have to make a fundamental difference between a temporal scale and all other types of scales potentially defining events/responsible for delimiting events. A measure expression, when applied to a non-temporal scale, creates an internal endpoint of an event; when applied to a temporal scale, though, the endpoint created is not internal.

I am not able to offer more than just an intuitive explanation for the distinction at the moment but I believe there in fact are deeper semantic reasons for it.

Intuitively, temporal duration is somehow external to an event. Every event proceeds in time[95] but the duration does not define the event as such, i.e. it usually does not define the event type. Specifying temporal duration of an event is rather like locating the event in a time slot (and by that contributing to its unambiguous identification), but it does not say anything about what happens *inside* the event (about its internal properties).

Things that are internal to events are e.g. the incremental theme argument or degree of change – these constitute events and distinguish one from another in a more substantial/interesting way than simply specifying their duration does. There is a substantial difference between *po-skočit* (po-jump) and *po-ležet si* (po-lie REFL) in that a jump is defined by its initial and final point; once one gets to the final point, the event naturally ends. As for lying (in bed), a natural endpoint is completely missing – there is no (linguistically expressed) change defining the eventuality – except for the trivial change in time –, hence, no endpoint of a change.

It would be strange to say that lying in bed for twenty minutes has an internal endpoint that can be reached (in twenty minutes).

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[95] Except for punctual events, perhaps.

98

Events (eventualities that have endpoints) can have either 'internal' endpoints (*build a house*, *walk 2 km*) or 'external' endpoints (*walk for 3 minutes*, *po-ležet si*); an event that has an external endpoint, i.e. that is delimited purely by delimiting its time, is not telic in the sense used here.

To sum up, temporal delimitation seems to have different status from other kinds of delimitation.

So, back to (96):

The interval on such a scale can be created by applying a measure expression to the scale. When such an interval is created on other than a temporal scale (defining the given event), the endpoint of the interval corresponds to the internal endpoint of the event and the event is telic. When the interval is created on a temporal scale, though, its endpoint is only an external endpoint of the event; so, the event is delimited but not telic.

An example of a telic verb corresponding to (96) is e.g. *po-skočit* (jump (once) a bit), *po-hubnout* (get thinner a bit/lose some weight); an example of an atelic but still delimited verb is *po-ležet si* (lie for a while), *po-přemýšlet* (think for a while).

The famous 'in an hour/for an hour' diagnostic is a test for telicity, not for delimitation[96].

What the 'in an hour' phrase does is specify *how much time it takes to reach the internal endpoint*. When there is no internal endpoint, it is not possible to use time-span adverbials.

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[96] The test is unfortunately only usable with events that take time; not with semelfactives, for example.

4.6.2. Do *po-* and *na-* delimit or telicize?

po-

When we consider the *po*-verbs from this perspective, there emerges an interesting distinction between the 'short while' *po*-verbs and the other two classes of *po*-verbs. Consider their (in)compatibility with durative / time-span adverbials:

(97a)   Po-po-jeli jsme *minutu / za minutu 3 metry

            po-po-drove *for minute / in minute 3 meters

            'It took us one minute to drive 3 meters'

(97b)   Za posledních několik dní /*posledních několik dní znatelně po-hubla

            in last few days   /*last few days   visibly po-lost-weight

            'She lost some weight in the last few days, not much, but enough to be noticed'

(97c)   Ty tulipány, kterés mi dal, po-vadly   *půl dne / za půl dne

            the tulips that-you me gave po-withered *half day / in half day

            'The tulips you gave me withered slightly in half a day'

'Short distance' and 'low degree' *po*-verbs combine with time-span adverbials, whereas 'short while' *po*-verbs combine with durative adverbials:

(97d)   20 min / *za 20 min jsem si po-ležela (a pak začala opět pracovat)

            20 min / *in 20 min AUX REFL po-lay (and then started again work)

            'I lay for a short time - for 20 minutes (and then started working again)'

(97e)   Po-hovořil s námi půl hodiny / *za půl hodiny

            po-talked with us half hour / *in half hour

            'He talked with us (for a short time) for half an hour'

Filip (2000) says that this behavior of ('short while') *po*-verbs is idiosyncratic and that verbs like *po-chodit* ('walk for a while') are in fact quantized (which for her means the same as telic).

My claim is, however, that this behavior of *po-* is not idiosyncratic at all. On the contrary, it is rather expected. The data in (97d,e) reflect the fact that the 'short while' *po*-verbs lack an internal endpoint – in other words, 'short while' *po*-verbs are not telic. The temporal scale with which *po-chodit* is associated is open and the interval created on it (by applying the measure prefix to it) does not provide an internal endpoint of the event, since temporal delimitation is essentially external. Hence, *po-chodit* cannot be combined with temporal adverbials requiring the internal endpoint. In other words, *po-chodit* is not telic.

However, this does not say anything about the quantization status of 'short while' *po*-verbs. In this respect, I agree with Filip that these *po*-verbs *are* quantized[97] (delimited).

So, to answer the question in the section title, what the delimitative prefix does is to make the predicate delimited. The fact that some of the verbs prefixed by *po-* are telic as well follows from the nature of the things being measured (i.e. by measuring path or degree of change of state, one creates an internal endpoint and, by that, gets a telic predicate; by measuring temporal duration, one fails to create an inherent endpoint, so, the result is a delimited, though an atelic predicate).

na-

As for the *na*-verbs, the situation is much easier. Here, the prefix always makes a predicate telic, because it always delimits the event by delimiting an interval on a non-temporal scale:

 (98a)   Na-trhal všechny ty květiny za půl hodiny / *půl hodiny.
         na-picked all   the flowers in half hour / *half hour
         'He picked all the flower in half an hour / *for half an hour'

(98b)   Za pět minut / * pět minut   sem Peter   na-nosil 50 židlí
         in five minutes / *five minutes here Peter na-brought 50 chairs
         'Peter brought 50 chairs in five minutes / *for five minutes'

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[97] Although they apparently fail the Krifka's definition of quantized predicates (see Filip, 2000).

(98c)   Za hodinu / * hodinu jsem se na-chodila   do sytosti[98]

         in hour / *hour AUX.1sg.f. REFL na-walked.P enough

         'In an hour / *for an hour, I had enough walking'

Po- and *na-* are quite different from each other. This has been already discussed. Now, we can see how these differences lead to different results with respect to telicity. Particularly interesting/revealing is a comparison of a *po-*verb and *na-*verb that are identical except for the prefix:

(99a)   Po-vařil ty[99] brambory 15 min / *za 15 min

         po-boiled the potatoes 15 min / *in 15 min

         'He boiled the potatoes /let the potatoes boil for 15 minutes'

(99b)   Za hodinu / *hodinu na-vařil spoustu brambor

         in hour / *hour   na-cooked lots-of potatoes

         'In an hour, he prepared lots of potatoes'

(99c)   U-vařil ty brambory *20 min / za 20 min

         u-boiled.P the potatoes *20 min / in 20 min

         'He boiled/cooked the potatoes in 20 minutes'

Since *po-* cannot quantify over the direct object, the direct object argument cannot provide a scale *po-* could delimit an interval on. The only scale available for *po-* in (99a) is, then, a scale of temporal duration. Hence, since the endpoint of the delimited interval on the temporal scale cannot be considered an *internal* endpoint of the event, (99a) is not compatible with a time-span adverbial (= is not telic).

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[98] For some reasons, many examples with *na-*verbs often sound good only when the temporal adverbial is at the very beginning of a sentence. It may have something to do with the emphasis that obligatorily accompanies these examples.

[99] The examples (99a,c) sound better when the object is specific. Nevertheless, one can leave out *ty* and the judgments do not change.

Na-, on the other hand, can and in fact must quantify over the direct object, so it does create an internal endpoint of the event by creating an interval on the scale associated with the direct object (the scale of quantity) (once one prepares a sufficient amount of potatoes, the event is over).

(*Na-* is like the perfectivizing prefix in (99c) in this respect.)

4.6.3. <u>Vagueness</u>

Kennedy and Levin (2002), after defining telicity as a result of quantizedness of the degree of change, discuss which measure phrases give rise to quantized degrees of change and which do not.

They give some examples of quantized measure phrases: *5 meters*, *10 pages*, *a scoop*, … and some examples of non-quantized measure phrases: *a bit*, *a quantity*, *a part*.

They claim that non-quantized measure phrases give rise to atelic predicates, which is supposed to be supported by the following entailments:

(100)

a)   The soup is cooling a bit. ⇒ The soup has cooled a bit.

b)   Kim is drinking a quantity of milk. ⇒ Kim has drunk a quantity of milk.

c)   The sub is ascending a part of the way towards the surface. ⇒ The sub has ascended a part of the way towards the surface.

(p.8, ex. 36)

However, they run into problems with temporal adverbials:

(101)

a)   The soup cooled a bit ?for 10 minutes/in 10 minutes

b)   Kim drank a quantity of milk ?for 30 seconds/in 30 seconds

c)   The sub ascended a part of the way towards the surface ?for an hour/in an hour

(p. 8, ex. 37)

Kennedy and Levin, however, argue that this is not a problem if they adopt Zucchi and White's analysis of twigs and sequences (Kennedy and Levin 2002, referring to Zucchi and White, 2001).

"First, we assume that the degree variables introduced by these expressions are existentially bound from outside the VP […]

[102]   a. The soup cooled a bit.
          b. $\lambda e[\textbf{cool}(soup)(\text{END}(e)) = \textbf{cool}(soup)(\text{BEG}(e)) + \textbf{d}]$

What is crucial here is that **d** [the variable for the degree of change] is free inside the VP. Since its value is determined by an assignment function, the VP is quantized: [102b] is true only of events that involve an increase in coolness by $g(\textbf{d})$-much. Assuming that for-PPs presuppose that the predicate they modify is non-quantized, we account for the incompatibility."

(p.12)

In other words, they preserve their claim that *a bit* is a non-quantized measure phrase and allow the whole sentence to be quantized at the same time.[100]

However, I argue against the claim that expressions like *a bit*, *a quantity* or *a sequence* are non-quantized. My claim is that the problems these expressions cause (e.g. the unexpected entailments in (100); the fact that they fail to be quantized according to (52)) are to be explained in terms of the vagueness of the expressions.

Expressions like the ones above and also those like *kývnout* or *pochodit* (see section 3.1. and 3.3.) do not conform Krifka's definition of quantizedness (52) exactly because they are vague – the definition does not take vague predicates

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[100] However, they do not comment on the entailment patterns in (100).

into account. There are, however, some proposals how to repair this state of affairs – i.e. how to account for the quantized interpretation of these expressions (or sentences containing these expressions: *John wrote a sequence (of numbers) ??for ten minutes / in ten minutes*, Filip, 2000, quoting Zucchi and White's example)), even though they should not be quantized, according to (52).

I am not going to comment on those proposals (see the discussion in Filip, 2000); I just want to defend the position that *a bit* or *po-* are vague but quantized measure expressions, since in given contexts, they refer to specific (quantized) quantities – we just, for some reasons, do not want to be explicit about their size. *A quantity of oranges* is fundamentally different from *oranges* in that *oranges* is really an unbounded whereas *a quantity of oranges* is bounded – we just do not know/express the exact boundaries.

Kývnout may seem non-quantized, since one may imagine subparts of nodding (once) which also count as nodding (once) but in any given context *kývnout* refers to a definite (this and no other) amount of moving one's head and it does not matter that in a different context a different amount of the same motion counts as *kývnout*, too.

The same applies to *po-chodit*. 'Walk for a while' is exactly like 'walk for 10 minutes' except that we do not express the duration of the walking event with such a precision. In a given context, it *can* mean 'for ten minutes' and it is irrelevant for its quantized status that in another context it may be thirty minutes.

The entailments in (100) are to be accounted for from the vagueness, too. If the soup is cooling a bit it has cooled a bit; but a different bit. Since a bigger and smaller bit can be both described as *a bit*, the entailments in (100) hold. We can use the same expression for different quantities just because the expression is vague.
If we can explain the entailments in (100) from vagueness, there is no need to explain them from the non-quantizedness of the measure phrases.

To summarize, I argue that vagueness should be distinguished from unboundedness / non-quantizedness. Vague measure expressions give rise to quantized/delimited predicates just like any other measure expression – hence all *po-* and *na-*verbs are delimited/quantized.

4.7. Last bits and pieces

4.7.1. Perfectivity and delimitation/telicity

The discussion of prefixation and its relation to delimitation and telicity would not be complete without mentioning the relation between perfectivity and delimitation/telicity.

My tentative proposal would be that essentially all perfective verbs (prefixed or simple) are delimited/quantized[101]. All simple perfective verbs are, presumably, also telic. Most prefixed perfective verbs are telic as well, with few exceptions when the delimitation does not lead to telicity (like in 'short while' *po-*verbs and the related class of *za-*verbs). No imperfective verb can be (part of) a telic predicate but it can be a part of a delimited predicate (like in *spal 5 hodin*), nevertheless, it cannot be delimited by itself, without a (temporal adverbial) modifier.

I would say, then, that in Czech, delimitation is linguistically relevant in the sense that it correlates with the class of perfective verbs.[102] Telicity is linguistically relevant in the sense that it correlates with the class of verbal predicates that are compatible with time-span adverbials.[103]

What I have not discussed at all is the precise relation between prefixation and perfectivity. So far, I am not sure whether I want to claim that prefixes carry the

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[101] There is a class of verbs (the *unést* type - see Filip, 2004), which constitute a clear counterexample to the claim. I know of no other prefixes that would behave like this *u-*, so I take these verbs to be real exceptions.

[102] I am talking about verbs by themselves, not verbal predicates with adverbial modifiers.

[103] This is a simplification: semelfactives are also telic, though incompatible with *any* temporal adverbials.

feature [+pf]. This would not lead to wrong predictions, since prefixation always leads to perfectivity.

Nevertheless, perfectivity is rather a morphological notion; hence, it should not be included in the semantic contribution of a prefix.

4.7.2. <u>Double quantification – a possible solution</u>

In section 2.4., I presented a problem that can be formulated like this:

How is it possible that one can say *napekl 200 housek* (na-baked 200 rolls) or *poskočil půl metru* (po-jumped half a meter)? If *na-* quantifies over the direct object and *po-* over the distance, how is it possible that we can "double" the quantificational information and use a numeral at the same time or measure the path once again with an explicit measure phrase?

In 2.4., I proposed that the explicit expressions of quantity like *200* and *půl metru* in fact do not double anything but they rather further specify the vague information of the prefixes. Why exactly this is possible while **upekl hodně 200 housek* (*PfPr-baked many 200 rolls) or **skočil málo půl metru* (*jumped a bit half a meter) is not clear to me; in 2.4., I suggested that the reason might be rather syntactic than semantic.

However, Øystein Nilsen (p.c.) suggested that the prefixes like *po-* and *na-* might in fact do something a bit different from directly quantifying over/measure things themselves. Namely, they may introduce a measure phrase or an expression of quantity that is either explicit (as in *napekl 200 housek* and *poskočil půl metru*) or implicit (as in *napekl housky* and *poskočil*) together with the presupposition that the quantity is relatively large (for *na-*) or small (for *po-*). The presupposition is than responsible for the fact that ??*napekl 2 housky* (??na-baked 2 rolls) sounds odd.

I find the suggestion appealing since it captures not only the fact that one *can* use another expression of quantity in the sentence with a *na-*/*po-*-verb but also the fact that one often *prefers* this option, as if the prefix itself had rather unclear/vague content.

Nevertheless, I think I could keep the analysis approximately as developed in the present chapter even if I adopted Øystein Nilsen's suggestion. I would just shift the burden of measuring things from the prefixes to the measure/quantity expressions they would introduce; the restrictions on the application (the types of scales these expressions would be able to apply to etc.) would have to follow from the fact that these expressions are introduced by prefixes.

To sum up, I have no developed story to offer for the "double quantification" problem although there seems to be a plausible way to treat the facts. At this point, I simply leave the issue open.

5. Summary

I have proposed an analysis of two measure prefixes, delimitative *po-* and cumulative *na-* – using a scalar model – as elements applying to events (of gradual change) and measuring/delimiting them by measuring/delimiting intervals on scales that are relevant for the delimitation status of the events. Following Filip (2000), I proposed a semantics of the prefixes as containing measure functions; however, I argued that there is no homogeneity requirement for extensive measure functions.

The distinction between *po-* and *na-* was claimed to be essentially structural, *na-* targeting scales associated with arguments in the (underlying) direct object positions, *po-* applying to all other types of scales responsible for delimiting events, but never to those introduced by direct objects.

I also proposed a general condition on measure modification (measure expressions can only apply to open scales) – mainly in order to capture the im-/possible combinations of measure and directional prefixes.

Finally, I tried to make a distinction between telicity and delimitation, referring to internal and external endpoints of events – corresponding to endpoints on the relevant scales. I argued that the *in an hour* test tests for telicity and not for delimitation (detecting the *internal* endpoint of the event) and that all *na-* and *po-* verbs – except for the 'short while' *po*-verbs – are both delimited and telic. The 'short while' *po*-verbs, as witnessed by their incompatibility with time span adverbials, are delimited, though, not telic in the sense used here (and by this, they constitute one of the few counterexamples to the common claim that perfective verbs are telic).

It is necessary to say that I have in no way exhausted the topic – as for some of the problems, I have only scratched the surface, other topics I have not touched upon at all. However, I hope I have showed that there is much interesting going on in the area of quantificational prefixes in Czech.

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