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Inferential behavior of degree achievements: an experimental study

Master's Thesis

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Brno, Spring 2021

Masaryk University
Faculty of Arts
Department of Linguistics and Baltic Languages

Field of study: General Linguistics

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Advisor: doc. PhDr. Mojmír Dočekal, Ph.D

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Declaration

Hereby I declare that this paper is my original authorial work, which I have worked out on my own. All sources, references, and literature used or excerpted during elaboration of this work are properly cited and listed in complete reference to the due source.

Bc. Mariia Onoeva

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Introduction

A class of deadjectival verbs, e.g., *cool, widen, dry, clear, loosen, harden, shorten, sweeten* and many others, is called DEGREE ACHIEVEMENTS (DAs). In the term itself, there is a notion of a gradable ('degree') change or process ('achievement'), so, it is argued that these verbs denote the change of state or behave inchoatively, i.e., they designate the beginning of an action, state or event.

The first intuition about DAs is that they convey a 'become *x*' meaning, where *x* is a core adjective. However, if someone *shortened the jeans*, it would probably mean that they are shorter they were before but, probably, they are not higher than the knees now. Although if *the dress dried*, it means that the dress became dry, so it is clear that no sleeve or any part of the dress can be wet. It seems these two verbs are completely different at the first sight but what *shorten* and *dry* have in common is a change of an object during a course of an event. These are examples of two possible readings of DAs — comparative and positive (Kennedy and Levin 2008).

The jeans example is the comparative reading and might be referred as 'become *x*-er', there is a bound context: the jeans at the end of the event are shorter then the jeans at the beginning, they are being compared to themselves, not to a special instance out of the event. The dress example ('become *x*') is the positive reading as a standard of being dry was reached — to have no wet part. In the latter case, it is possible to tell that the dress reached an end point: at the beginning it was not dry then during the course of the event it became dry, so a predicate is telic. The predicate in the jeans example *shorten* is, however, atelic because it does not lead to a particular end, there is no fixed standard to be met (Kennedy and Levin 2008).

One of the main DA puzzles is their varied telicity. DAs can be either telic or atelic but some of them can be both with regard to their arguments. Consider the examples in (1):

(1) a. The soup cooled in 10 minutes.

b. The soup cooled for 10 minutes.

From above it is possible to conclude that a predicate in (1a) is telic because the soup is cool in a sense that a possible standard of coolness for soups was achieved in 10 minutes. *Cooled* in (1b) is atelic; even if it is now cooler then it was at the beginning, no specific end state was reached: it could be still hot but cooler than it was ten minutes ago.

What is also interesting, Slavic add more to the varied telicity puzzle. Slavic DAs allow the different types of prefixes and might end up in both interpretations. Consider the examples in (2):

(2) a. *Rubaška* {*soxla, vy-soxla, pod-soxla*}. *Russian*
shirt dried, out-dried, under-dried
'The shirt dried.'

b. *Sál se* {**prázdnil, vy-prázdnil, u-prázdnil*}. *Czech*
hall REFL emptied, out-emptied, at-emptied
'The hall emptied.'

In (2a), there are three verbs available, however, only one of them denotes the telic interpretation, *vy-soxla* 'out-dried', the remaining two tell that an event of drying was not finished and the standard of being dry was not reached. In (2b), the same picture of two possible interpretations, but it also shows that some Slavic DAs are not felicitous without prefixes, so prefixation must be taken into account.

The explanation of such behavior might be found in the structure of their core adjectives. In the first chapter of the present work, in section 1.1, I will discuss the adjectival scales and describe their different types. However, DAs are not adjectives but the fully functioning verbs, therefore, it is necessary to take a look at the verb class in section 1.2 and specifically at verbal aspect.

In the second chapter, I will introduce three notable approaches aiming to resolve the varied telicity puzzle. The first one was established in Dowty (1979) and then expanded by Abusch (1985), it is presented in section 2.1. They argue that since the core adjectives of DAs are vague and ambiguous, that is why DAs show the aspectual inconsistency. Hay et al. (1999) introduce the second approach, which is the topic of section 2.2, where they criticize the first and suggest a different point of view on the varied telicity puzzle. They claim that DAs inherit the structures of the scales of their core adjectives which

might be either closed or open, and it affects telicity. However, it is not perfect, that is why the third approach by Kennedy and Levin (2008) was developed, it is introduced in section 2.3. It is built on Hay et al. (1999) and improves it: Kennedy and Levin (2008) argue that DAs encode measure functions which associate objects with ordered values on the scales. The scales again are provided by the core adjectives. The chapter is ended by section 2.4 with the summary of Kawahara (2017) where he claims that Japanese DAs do not behave as predicted by Kennedy and Levin (2008).

In the third chapter, I will discuss Slavic DAs. In section 3.1, I will first introduce the morphological structure of Slavic verbs and then, in section 3.2, will turn to Czech and Russian DAs. The third chapter is a theoretical base for the fourth chapter, where I will present the structure and results of the experiment that was conducted for the thesis. In the fifth chapter, I will summarise the whole work and bring to light the remaining open questions.

1 From adjectives to verbs

Adjectives and verbs are two separate word classes with different grammatical, syntactical and semantical properties. Adjectives are usually characterized as words describing additional quality or property of nouns, whereas verbs are words for actions and occurrences. Criteria for their distinction may vary from language to language and it is possible that a concept could be wrapped as an adjective in one, while in the other it is a verb and visa versa (Dixon and Aikhenvald 2004).

The present work aims to analyse DAs which are deadjectival verbs, that is why it is necessary to outline briefly some important concepts for both adjectives and verbs which will be used further. In this chapter, I will first describe a well-known concept of the adjectival scales, then in the section dedicated to verbs will turn to verbal aspect.

1.1 Adjectives

It is highly possible that all languages distinguish two word classes — nouns and verbs. The class of adjectives is not universal: some languages do not posses them or their amount is little (Dixon 1982). Nevertheless, it does not mean that in such languages concepts known as adjectives are not present, they are usually expressed in some other ways, e.g., by verbs or nouns.

However, if the languages exhibit adjectives, there are two typical adjectival positions in sentences: (i) together with or without the copulas in a predicate position; (ii) around nouns (but not just them) where they provide additional information as the attributive modifiers. In most languages, adjectives might be found in both positions, but in some there is only one available (Dixon and Aikhenvald 2004; Kennedy 2012; McNally 2016).

Just like verbs, adjectives can supply the main predicate term in sentences as in (3). Kennedy (2012) argues that the verb *be* does not have the central role here: firstly, it is just a host for tense and agreement information, secondly, some languages do not require it at all, e.g., a Russian sentence in (3b) is a translation of the English in (3a), but there is no copula verb.

(3) a. The stone is heavy.

b. *Etot kamen tjaželyj.*
this stone heavy

Unlike verbs, adjectives in the predicate position can combine with degree words like *rather, very, too, enough, how*. The sentence in (4b) can be enhanced by *too much* but direct combination with degree words is unlikely. Kennedy (2012) links it up with a scalar nature of some adjectives which will be discussed further below.

(4) a. The country is too dependent on foreign oil.

b. *The country too depends on foreign oil.

For the second adjectival function in sentences, namely attributive modification, it depends on a language if the adjectival position matters: sometimes adjectives can precede and go after nouns, but for others only one position is available. For instance in French, there are three possible placements: prenominal adjectives only, postnominal only, and both which is the biggest group (Abeillé and Godard 2000). However, English adjectives are ambiguous in the prenominal position but unambiguous in the postnominal, consider example in (5) (Kennedy 2012):

(5) a. All of his unsuitable remarks will be eliminated from the final text.

b. All remarks unsuitable (for publication) will be eliminated from the final text.

The sentence in (5a) can be understood in two ways: the first reading is that all his remarks are unsuitable, and thus they all will be eliminated; in the second reading, only those remarks that are unsuitable will be removed. However, for the sentence in (5b) there is the latter reading available only.

It seems that adjectives behave more or less similar in sentences through the languages but their inner morphological structure may vary vastly. For instance, in terms of grammatical categories Czech

and Russian nouns share similar features with adjectives, namely case and number inflection. However, unlike nouns, adjectives inherit a gender feature, i.e., they are in agreement with a subject. But some other word classes, e.g., pronouns, numerals, participles, behave in the same manner, so agreement cannot be counted as the adjectival feature only. Moreover, it applies to these two languages as they are known as highly inflected, but the languages like English and many others do not care about it much.

When it comes to meaning of adjectives, there are several different ways to look at it. One of the approaches for their typological division is to lean on descriptive content provided by adjectives. McNally (2016) defines these typologies as notionally-based. Such classifications can be generally found in descriptive grammars or philological works. McNally provides as an example a typology by Picallo et al. with three distinct adjectival classes which are listed below:

- Qualitative: denote properties or qualities of some entity — *male, sick, red, good*
- Relational: morphologically denominal, semantically contribute a property of the nominal root to the individual of the noun they occur with — *parliamentary, metallic, golden*
- Adverbial: the remaining adjectives — *possible, frequent, fast*

In Russian and Czech traditions, some similar distinctions can be found. Švedova (1982) have adjectives *kačestvennyje* 'qualitative' opposed to *otnositelnyje* 'relational', the latter group is also divided to *sobstvenno otnositelnyje* 'properly relational', *porjadkovyje* 'ordinal', *mestoimennyje* 'pronoun adjectives', *nepritjažatelnyje* 'non-posessive', *pritjažatelnyje* 'posessive'. In Karlík (2017), there are two main classes *kvalitativní* 'qualitative' and *relační* 'relational' but, unlike Russian, the former class is divided into *deskriptivní* 'descriptive' and *kvalifikační* 'qualifyng'. The Russian scheme is represented in Figure 1.1, the Czech one is in Figure 1.2.

Figure 1.1: Russian notionally-based adjectival typology

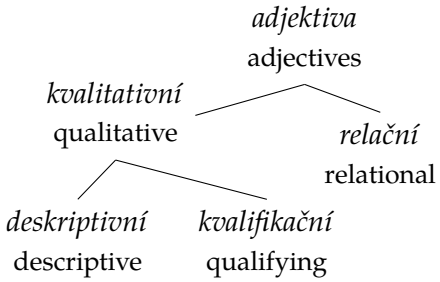

Figure 1.2: Czech notionally-based adjectival typology

A different typology was suggested by Dixon (1982). He detects these adjectival classes in English:

- dimension — *big*, *large*, *wide*, *long*, *small*, *narrow*, *fat*
- physical property — *cool*, *hard*, *soft*, *heavy*, *sweet*, *smooth*, *rough*
- color — *black*, *red*, *white*
- human propensity — *jealous*, *happy*, *kind*, *clever*, *gay*, *cruel*, *rude*
- age — *old*, *new*, *young*
- value — *good*, *proper*, *perfect*, *poor*

- speed — *fast, quick, slow*

Dixon omits a position class with such adjectives as *far, left, right, near, low* etc., as they are "most frequently dealt with through Adverbs in other languages" (Dixon 1982, p. 16). He further provides some semantical, syntactical and morphological properties of these seven classes. Dixon mentions that certain adjectives can form verbs, e.g., *deepen, roughen, darken*, while others cannot: consider a human propensity adjective *rude* — **ruden*. Although in Russian, it is possible to derive the verbs from the same adjective *grubyj*: *grubit'* 'to be rude', *nagrubit'* 'to say something rude'. However, *grubyj* is ambiguous between *rude* and *rough* which is from the physical property class but both verbs above denote *ruden* meaning.

Dixon notes that deadjectival verbs are either marked by *-en* suffix or equal to adjectives they are derived from. It appears that *-en* nowadays is combined with the stems ending to -p, -t, -k, -f, -s, -ʃ, -θ or -d. Worth to mention a verb *to worsen*, a suppletive form from a value adjective *bad* with an obvious scale movement. Dixon also brings up a verb *to good* which lost its 'to improve' meaning.

Notional typologies can be similar or very distinct. It is always mentioned that adjectives may move from one class to another depending on the context. Moreover, it is hard to define how many classes should be there (McNally 2016). These typologies are not universal and even related languages might have very distinct types.

Nevertheless, there is one semantic feature that might set adjectival concepts apart from most nouns and verbs among the languages, it is scalar measurability. It also helps to provide an inner distinction of this class. In the present work, the division based on the adjectival scales is important for the DAs analysis, that is why a detailed overview of this approach follows.

1.1.1 Scales and degrees

A different approach to characterize adjectives is to perceive them as gradable or non-gradable. Consider (6), the gradable adverbs *very, slightly, extremely* are grammatically combined with the adjectives in (6a), while in (6b) are infelicitous.

(6) a. {*very, slightly, extremely*} warm, weak, long, popular, rich...

b.*{*very, slightly, extremely*} freezing, dead, nuclear, digital, domestic...

It is possible to coerce the adjectives in (6b) to some degree meaning but it would be marked by an additional connotation. The adjectives in (6a) are of the gradable nature, their meaning can vary between some degrees in the different domains, e.g., width, temperature, weight, so they are fine with such modifiers, hence, some inner scale affects their meaning.

The scales in linguistics could be characterize in three different ways: in terms of properties of the set of degrees, in terms of the dimensional parameter, and in terms of the ordering relation (Kennedy and McNally 2005). The dimensional parameter is what differ *long* from *warm*: the first measures length in centimeters or other units in linear extent, the second is related to temperature usually in Celsius or Fahrenheit. The ordering relation is a direction within dimension, e.g., *cold* and *warm* are placed on the different edges of the temperature scale, so they are not ordered in the same way.

The set of degrees characterizes a structure of the scale itself. It can be dense or discrete, with or without minimal or maximal points. From it follows that the adjectives might have various structures of scales, hence, they might behave differently. Consider the examples in (7), all are good without *completely* but the sentences in (7a) and (7c) are ungrammatical with it:

(7) a.*The classmate is completely tall.

b. The window is completely open.

c. The street is completely safe.

d.*The street is completely dangerous.

Completely triggers exactly the set of degrees of these adjectives. Perhaps, the classmate from (7a) is the tallest in the class or even in the school, but it does not entail that he is *completely tall*, there is no completeness in 'being tall', no end point. The window in (7b),

however, has such points, it can be open or closed, so there is nothing wrong with it to be open completely. *Safe* and *dangerous* in (7c-d) are antonyms, but while there is the maximal degree of 'being safe' — to have no threat or obstacle, with 'being dangerous' it is not possible to reach the maximal point.

Slightly also triggers the set of degrees but in a different way. Consider the examples from above but with *slightly* in (8):

(8) a. *The classmate is slightly tall.

b. The window is slightly open.

c. *The street is slightly safe.

d. The street is slightly dangerous.

Unlike *completely*, *slightly* applies to the minimal degree. From (7a) and (8a) follows that *tall* has no maximal or minimal point, *open* has both as it is felicitous both in (7b) and (8b), *safe* has only the maximal point because it is awkward with *slightly* in (8c), while *dangerous* should have only the minimal one.

Kennedy and McNally (2005) distinguish four types of the adjectival scales – totally open, totally closed, lower-closed and upper-closed. To put things more formally, they propose to treat the set of degrees D on the scales as the real numbers between 0 and 1 which in turn are the minimum and maximum on the scales. Hence, if we apply it to *tall*, it should a have totally open scale isomorphic to $D_{(0,1)}$. The scale for *open* in this case is closed from both ends and be $D_{[0,1]}$. Finally, *safe* is upper-closed $D_{(0,1]}$ and *dangerous* is lower-closed $D_{[0,1)}$. This distinction correctly predicts the acceptability of adjectives with the particular modifiers such as *completely, slightly, fully, 100%, almost, very*. In Figure 1.3, there are the visual schemes for the inner scalar structures of gradable adjectives.

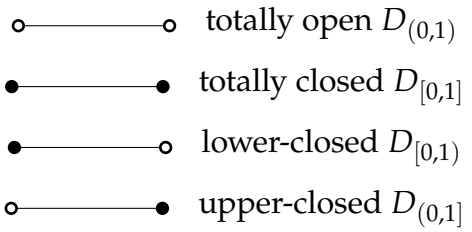

Figure 1.3: Scales of gradable adjectives

Gradable adjectives can be also distinguished to absolute and relative. The difference between them is whether the meaning of an adjective in a positive form is context dependent or not (Kennedy 2007). Consider the examples in (9):

(9) a. The rod is straight.

b. The coffee is expensive.

(9a) is true only in one possible situation when no part of the rod is curved, it is the standard definition of 'being straight'. However for (9b), no clear definition of 'being expensive' exists, there could be various situations in which the price of the same cup of coffee would be expensive for one person but for another it would be affordable.

The structure of the scale might affect if an adjective is relative or absolute. When one pictures two things — *a dry shirt* and *a dry skirt*, it is clear that they both exceeded the same maximum on the scale when they are not wet anymore. They are dry in the same sense, so no additional context is needed because *dry* has its own fixed lexical (or conventional) meaning which is regulated by its scale. However, it does not equally apply to *a wide shirt* and *a wide skirt*: all of a sudden they are wide in the different ways: one in the context of skirts and other in the context of shirts as for the adjective *wide* there is no maximum to be crossed. Hence, the open scale adjectives are relative, while the totally closed, lower and upper-closed are absolute.

Another feature which might be closely related to the present adjectival distinction is evaluativity. If and only if it is conveyed that the property associated with the gradable adjective construction is instantiated to a degree above a particular standard or threshold, it

means this construction is evaluative (Brasoveanu and Rett 2018). Consider (10):

(10) a. John is tall.

b. John is taller than Sue.

c. John is as tall as Sue.

In the sentence (10a), there is a positive form of *tall*, while in (10b) there is a comparative version of the same adjective. (10a) implies that John is significantly tall in the given context, whereas for the sentence in (10b) to be true it is not necessary for John to be tall at all, it is enough if he is a bit higher than Sue. From (10c) follows that John and Sue are the same height, however, it is not obligatory that both of them are tall. The construction in (10a) is evaluative because, as per the definition, it contributes 'taller than average' meaning which is a crossing of some standard (Brasoveanu and Rett 2018).

In Kennedy (2007), it is argued that the structures of adjectival scales might affect the evaluativity patterns. More precisely, if there is any bound on the scale, this bound might be used as the evaluative standard; for the scales with no bounds, it is set by the context what is the standard. The adjective *tall* in (10) is the relative one and it is argued that in general relative adjectives display this particular type of evaluativity. Partial absolute adjectives are evaluative across degree constructions, while total absolute are only evaluative in the positive constructions. Brasoveanu and Rett (2018) run several experiments testing these assumptions and conclude that relative adjectives are significantly more evaluative in the equative constructions as in (10c), while absolute are more evaluative in the positive constructions as in (10a). For a detailed overview, see Brasoveanu and Rett (2018).

The best way to sum up all above is to provide a visual scheme of the adjectival types mentioned above, it is in Figure 1.4

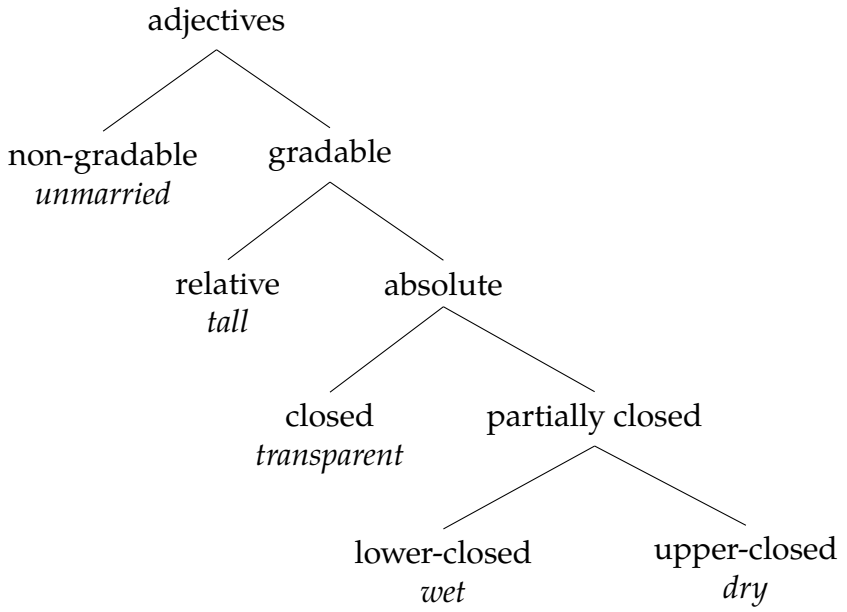

Figure 1.4: Adjectival distinction (Brasoveanu and Rett 2018)

The scalar adjectival contrast is a very important concept for the further DAs analysis. Kennedy and Levin (2008) claim that the scale structure directly affects the varied telicity of deadjectival verbs. However, in order to proceed with that, there is need to take a closer look to the verb class and define some essential points which will merge together with the subject from this section and be applied to the analysis of DAs.

1.2 Verbs

As mentioned above, it is quite possible that all languages distinguish verbs and nouns as the word classes. Nouns usually refer to "perceptually salient natural partitions in human environment" (Viberg 2006, p. 408), thus, tend to have common meaning across the languages, whereas verbs are language-specific and show variations with respect to meaning. In general, verbs are more complex and involve a change

through time while nouns usually represent entities that are stable (Viberg 2006).

In sentences, when verb is a core of a clause, it might be accompanied by one or more noun phrases, i.e. arguments. Verbs and noun phrases could be in different relations. Consider the sentences in (11): *coughed* in (11a) has only a subject and cannot take a direct object, which means it is intransitive, while in (11b) both the subject and object are felicitously linked with *kissed*, so this is an opposite case where the verb is transitive.

(11) a. Susie coughed.

b. Mary kissed John.

When the verb is transitive, it means that its activity is being transferred from an agent to a patient; hence, it does not apply to intransitive verbs as they take only one participant. Some verbs can behave transitively and intransitively in the different contexts, i.e., they are ambitransitive. For instance, *to smoke* or *to eat* are of a transitive nature but they can be found without any direct object — *He is eating* vs. *He is eating a sandwich*. The opposite intransitive case, e.g., *It's raining* is forced to transitive reading in *It's raining cats and dogs*, but these are the rare cases (Dixon and Aikhenvald 2000).

From the morphological point of view, there might be three markers on the verbs: valency markers, agreement/reference markers, and Tense-Mood-Aspect (TMA) markers, however, their combinations and number may vary across languages. Valency refers to the number and nature of verbal arguments. Many verbs show similar valency patterns, e.g., take the same number of arguments or mark arguments in the same fashion. Some certain semantic features of arguments might affect verbs, hence, the additional morphological markers can appear on verbs. This phenomenon is known as agreement. As an example, consider English third person singular *s*: *You/they know*, but *She/he knows* (Viberg 2006).

Tense is a grammatical category that locates situations in time. It is usually expressed overtly on the verbs by way of morphological markers or specific auxiliary words. There are two types of tenses – absolute and relative. Three absolute tenses, past, present and future,

are anchored directly with respect to the utterance time, while relative tenses locate the situation time not directly: it might precede, follow or overlap with the time of utterance. It may vary from language to language how many tenses they distinguish formally and how they are organized semantically (Fabricius-Hansen 2006).

Mood is a grammatical category which expresses degree or kind of reality attached to an utterance. According to Allan (2006), the western classical linguistic tradition distinguishes three moods: indicative, subjunctive, imperative, however, there are more of them, e.g., optative, conditional, potential etc. Mood and modality is a vast subject itself and will not be covered here, whereas verbal aspect is discussed further in great detail as it is closely related to the topic of the present work.

1.2.1 Aspect

Beside the clear contribution of tense, temporal information is delivered to sentences by verbal aspect. It helps to capture how events or occasions are described in sentences: if they are dynamic or static and if there are the initial or end points. Dowty (1979) mentions, this observation was noted by Aristotle and originates from his *kineseis* 'movements' and *energiai* 'actualities'.

One of the first linguists who made a step towards a solid verbal aspect classification was Zeno Vendler (Dowty 1979). In Vendler (1957), he posits that in English there are some certain common schemes which can describe this subtle verbal dependence on time. He names the predicates belonging to these schemes activity, accomplishment, achievement, and state terms.

Activities like *running, pushing a cart* are homogeneous: any part of the process is of the same nature as a whole. Accomplishments, e.g., *run a mile, draw a circle, write a letter*, are different: they proceed towards a finite point during some period of time. Achievements, e.g., *reach the top, win the race*, just like accomplishments have their climax but they imply the notion of a single and unique moment of time. And the last, states, e.g., *loving, knowing*, have no finite points, are not unique or definite, do not occur in progressive or imperative (Dowty 1979; Vendler 1957).

Smith (1997) enhances Vendler and introduces a two-fold theory with situation types on one hand and viewpoints on the other: they

constantly interact and result in the aspectual meaning. Smith's theory is more complex and captures the aspectual features of verbs and verbal phrases in a broader range.

A traditional grammatical distinction of verbal aspect is between perfect (bounded, finished, unified) and imperfect (continuous, repetitive, partial). Smith treats these two and additional neutral as the variations of viewpoint, the first component of the two-fold theory. Viewpoint gives a complete or partial look of events described in sentences. Viewpoint aspect is easy to identify because it is usually marked by the certain grammatical morphemes and some of them may even bear a lexical content as well. To give an illustration, check Russian *čitať* and *pročitať* both with the meaning 'to read' but the second is tagged by the prefix *pro-*, and thus it is perfect, but it differs from another perfect verb for a reading action *vyčitať*, the prefix *vy-* adds an additional meaning – learning something by reading.

However, not every language marks perfect/imperfect distinction overtly, for such cases neutral viewpoint is introduced. It is flexible and could have both readings. For instance, French le futur simple and some Chinese constructions without a viewpoint morpheme allow the bounded and continuous readings at once. Unlike imperfect viewpoint, neutral can allow the perfect reading which can be verified by some tests.

The second component of Smith's theory is situation types. In comparison to viewpoint, situation types are not grammatically indicated but they are expressed by the verbs constellations, so it is a semantical property. According to Smith, there are five types: states, activities, accomplishments, semelfactives and achievements. Situation types provide temporal features of sentences, they reflect if the described occasion is dynamic or static, telic or atelic, durative or instantaneous.

Static/dynamic is the primary distinction for situation types, it divides them to states and events. *The tree is green* or *Bill knows the truth* are states. Even if states develop in time they are not in motion themselves, they are stable and undifferentiated without an internal structure with no start or end point. On the other hand, everything that is not a state is an event. Events take place in time, may have the different internal structures and are dynamic. If something *occurs, happens* or *takes place*, it is an event. As per Table 1.1 below, all except statives are dynamic, thus they are events.

Events can be telic/atelic. Greek *telos* means 'end' or 'goal', so this distinction is about completeness. It might look similar to perfect/imperfect distinction but it is important to mention that telic/atelic is a semantic contrast. When the goal is reached, the event is telic. Atelic events are processes, they can stop any time without any outcome. Consider *push a cart* and *eat an apple* examples: for the former it will be true for any part of the interval with no ending, hence it is atelic, while for the latter there is a final point of the event when the apple is finished, so it is telic. Accomplishments and achievements are telic events because they have outcome. States do not have any end point as they are not durative; activities consist entirely of the process, their termination does not follow from the event; and as semelfactives indicate a single-stage event and occur very quickly, they cannot have any outcome or change of state.

Durative/instantaneous is a rather conceptual distinction but Smith argues that it is a linguistic category. Instantaneous events structure is simple, it usually consists of one stage, e.g., *Emily coughed; Someone knocked at the door; The daughter broke the cup*. Semelfactives and achievements are instantaneous while the others are durative. Durative events are continuous and hold for a moment or interval, e.g., *Joe built the house; The cat is meowing for an hour*, the same applies to statives though they are not events.

In Table 1.1 there is a summary of situation types by Smith with the examples.

Table 1.1: Smith's classification of situation types

Statives	static, atelic, durative	*know French*
Activities	dynamic, atelic, durative	*laugh*
Accomplish.	dynamic, telic, durative	*climb a tree*
Semelfactives	dynamic, atelic, instant.	*knock at the door*
Achievements	dynamic, telic, instant.	*cure a patient*

Conclusion Since the aim of the present work is to examine DAs which are deadjectival verbs, in this chapter I briefly described the features of adjectives and verbs separately which will be essential for the further analysis. In the first part of the chapter, the scalar approach was introduced for gradable adjectives with four possible structures: totally open, totally closed, upper-closed and lower-closed scales. According to Kennedy and Levin (2008), the adjectival scales directly affect telicity of DAs. Their approach and two others will be articulated in the next chapter on the examples from English and Japanese.

In the second part of the chapter, it was talked about verbal aspect. I introduced the following aspectual schemes: the first by Vendler where he detects activity, accomplishment, achievement, and state terms, and the second two-fold approach by Smith, where she develops Vendler and separates viewpoint and situational aspects. In the third chapter, I will discuss Slavic verbs, thereby I will use the material from this chapter. Since Slavic languages are highly inflected, both prefixes and suffixes contribute to verbal aspect. Using the examples from the different languages, I will decompose Czech and Russian DAs and show how they differ from English.

2 Formal approaches to degree achievements

Dowty notes that some verbs derived from adjectives at the first glance behave like telic achievements but allow durational adverbs (Dowty 1979). Smith (1997) includes them to activities as they indicate the increase or decrease of a property and do not require a particular degree to be reached, so they are atelic. Kearns (2007) argues that such verbs can be Vendlerian accomplishments and achievements: the positive ('become *x*') and comparative ('become *x*-er') readings, both describe the events that are telic but not always instantaneous, she also refers to them as CHANGE-OF-STATE VERBS. Abusch (1985) calls this class VAGUE INCHOATIVES. Such terminological inconsistency might be somehow misleading, but in this work I will continue to use the term DEGREE ACHIEVEMENTS or simply DAs as it is more common in literature.

The main puzzle of DAs is their varied telicity. There are several notable approaches which aim to resolve it and three of them are introduced in this chapter. It is organised as following. The chapter starts with an approach by Dowty and Abusch where it is argued that DAs are based on vague predicates. The next two by Hay et al. and Kennedy and Levin are based on the idea that the scales of the core adjectives are responsible for the varied telicity, however, they implement it differently. After I will conclude the chapter with a brief summary of Kawahara (2017) about Japanese DAs.

2.1 Dowty (1979) and Abusch (1985)

An assumption made by Dowty which was then developed by Abusch comes from an idea that the meaning of DAs is based on the properties of the adjectives they are derived from. More precisely, they argue that the reason why DAs may have varied telicity is that the adjectives they are based on are vague predicates.

For non-vague predicates it is possible to declare if an object possesses or does not possess a given property, e.g., *being pregnant* or *dead*, while with vague predicates it is not always clear if the properties are definitely true or definitely false for the objects they apply to. A predicate *to be bald* is occurred to be vague as there is no clear definition of baldness, it has blurry borders, the object can be either inside

or outside its expansion: one could have no hair at all while another could have some amount of hairs and still both be considered bald.

Dowty supposes that *cooled* in (12) is a vague predicate which changes its state in terms of its vagueness or ambiguity during the interval of ten minutes. Hence, at the beginning of the event, the soup is a border case of *cool* and at the end it became *cool*. So, Dowty states it as $BECOME[the\ soup\ is\ cool]$ which is true for each time t during the given ten minutes interval and false at $t-1$. Due to such vague behavior DAs have varied telicity (Dowty 1979).

(12) a. The soup cooled in ten minutes.

b. The soup cooled for ten minutes.

Abusch takes the Dowty's assumption and goes a bit further. She argues that a lexical meaning of a DA is represented in (13a) and it has truth conditions as in (13b). P is a property of individuals, where $P(x)$ is false at the beginning of the event $(init(e))$ and true at the end $(fin(e))$, so the DA is a function from contexts to properties of individuals.

(13) a. $\lambda x \lambda e.BECOME(P)(x)(e)$

b. $BECOME(P)(x)(e) = 1\ iff$
$P(x)(init(e)) = 0\ and\ P(x)(fin(e)) = 1$

However, the DAs puzzle is still unsolved. Abusch makes a step towards it and supposes that a contextual argument of *cool* is fixed to the context of utterance for the positive telic reading and it is bound by an existential quantifier for the comparative atelic one (Kennedy and Levin 2008).

(14) a. $\lambda x \lambda e.BECOME(cool(c_u))(x)(e)$

b. $\lambda x \lambda.\exists c[BECOME(cool(c))(x)(e)]$

In (14a), $cool(c_u)$ is the property of 'being cool' in the context of utterance, so it would be true for x if it is not as cool as the standard which was given by the context at the beginning of the event and at

least as cool as the standard at the end. The contextual standards can depend on both properties of the objects (*cool lemonade* vs. *cool coffee*) and the properties of the context (*cool morning coffee* vs. *cool ice coffee*). This is a positive reading as in (13a).

In (14b), the context variable is limited by the existential quantifier, so the final soup temperature in (14b) is being compared to the initial soup temperature but not to some standard outside of the event. Hence, there is no end state of coolness to reach, the soup could be still hot but for the given context it would be true anyway as the starting temperature differs from final. This is the comparative reading.

Following this, it is reasonable to assume that all DAs behave like *cool* and it explains their variable telicity, however, this assumption is not correct. Kennedy and Levin (2008) stand out three disputable points of the Abusch's approach which are listed below (1-3).

1. Not all DAs have both telic and atelic readings as *cool* does, some of them are defaultly telic. They can be forced to atelic by explicit morphosyntactic or contextual information but without it these DAs are treated as telic. Consider the examples in (15):

   (15) a??The sky darkened but it did not become dark.

   b??The sink emptied but it did not become empty.

   The sentences in (15) are not completely bad but are not fully acceptable either. This contradiction test shows that *darkened* and *emptied* likely have the telic reading only, which can be explained pragmatically: the telic interpretation entails atelic, thus it is more informative and stronger.

2. Some DAs, e.g., *deepen* or *widen*, seem to possess the atelic reading only as they accept durative temporal modifiers exclusively, so there is no option as in (13b) for them. Consider the examples in (16):

   (16) a. The gap between the boats widened {for, ??in} a few minutes.

   b. The recession deepened {for, ??in} several years.

Moreover, there is an automatic entailment from progressive to perfect for *cool* and *dry* in (17a-b), whilst (17c-d) are contradictory.

(17) a. The soup is cooling, but it hasn't cooled.

b. The shirt is drying, but it hasn't dried.

c. *The gap is widening, but it hasn't widened.

d.*The recession is deepening, but it hasn't deepened.

This issue is more serious than the previous one as how it was mentioned above, telic probably entails atelic but not visa versa. The gap in (16a) most likely became wider in the sense of (13b) but did not reach the standard of wide gaps as in (14a). In (17a-b) there is a denial of the process but not of the final telic result.

3. DAs with measure phrases are hard to fit in (14). Consider the examples in (18), *17 degrees* and *6 inches* push DAs to the telic reading and display the amount of change:

(18) a. The soup cooled 17 degrees.

b. The gap widened 6 inches.

Coercing the sentences to a desirable state in (19) does not result well for *cool* and deliver a different meaning for *wide*.

(19) a. *The soup became 17 degrees cool.

b. The gap became 6 inches wide.

According to Kennedy and Levin, the Abusch's approach "is not equipped to convey this kind of meaning" (Kennedy and

Levin 2008, p. 7) when DAs just like comparatives show differential amount of objects but instead result in total width or temperature.

The described approach has several flaws and cannot resolve the varied telicity of DAs. Abusch and Dowty assumed that the vagueness of predicates is a core ingredient which leads to this particular behavior. Probably, Dowty referred to DAs as achievements as he implied 'to become x' meaning which obviously leads to the telic reading, however, it is not always the case. The further analyses step aside from it and assume that the scales of adjectives affect telicity of DAs.

2.2 Hay, Kennedy and Levin (1999)

The next approach discussed in Hay et al. (1999) addresses the varied telicity of DAs by introducing a measure argument — a difference value, which solves one of Abusch's problems, namely the third one, the union of DAs and measure phrases. Hay et al. assume that if DAs are derived from gradable adjectives, they have the scalar nature as well. Specifically, they claim that the objects of transitive DAs and the subjects of intransitive change with respect to the gradable property introduced by adjectives. Hence, the examples in (20) can be paraphrased:

(20) a. Kim lengthened the rope. → Kim caused the length of the rope to increase by *some amount*.

b. Kim lengthened the rope 5 inches. → Kim caused the length of the rope to increase by *5 inches*.

Hay et al. presume that an -en/∅ morpheme, which derive DAs from adjectives, implements a function $INCREASE$: it takes a gradable adjective meaning ϕ and "returns a description of an event of some object undergoing a change in the degree to which it is ϕ" (Hay et al. 1999, p. 5). In (21), the truth conditions of the proposal.

(21) $[\![INCREASE(\phi)(x)(d)(e)]\!] = 1 \; iff \; \phi(x)(SPO(e)) + d = \phi(x)(EPO(e))$

Similarly to $init(e)$ and $fin(e)$ in (13b), $SPO(e)$ and $EPO(e)$ are the functions from events to times that return the start and end points. The positive value d is the difference value that represents how much x changed in terms of ϕ during the course of the event. The difference value can be hidden or overtly expressed in the sentences which resolves the third problem of the Abusch's approach. The examples in (20) now can be rewritten in (22):

(22) a. $\exists e, d[INCREASE(long(rope))(d)(e)]$

b. $\exists e[INCREASE(long(rope))(5\ inches)(e)]$

Hay et al. cover the varied telicity puzzle and argue that it depends on whether the difference value d is bounded or non-bounded. They compare it to a mass/count distinction: a mass noun *rice*, unlike a count noun *a plum*, is not physically bounded, thus some verbs, e.g., *to eat*, show atelic interpretation with it (*to eat rice*), but telic with count nouns (*to eat a plum*). So in DAs case, if the difference value is bounded, the verb is telic, and the non-bounded difference value results in the atelic reading.

The difference value is bounded if there is (i) a measure phrase, or (ii) a degree modifier that refers to the end point, e.g., *completely*. However, DAs can have the telic reading without any overtly expressed modifier what can be explained by the adjectival scales. Hay et al. follow the assumption that there are two types of adjectives — with the open (*long, wide, short*) and closed scales (*empty, straight, dry*). DAs based on the open scale adjectives allow the default atelic interpretation, while the adjectives with the closed scale adjectives form DAs of the telic nature. The structure of the closed scale adjectives allows an increase to the maximal change, thus the difference value is bounded by the maximal points for DAs based on such adjectives; so, if the maximum reached, the predicate is telic. The difference value is non-bounded for DAs formed from the open scale adjectives as they do not posses any minimal or maximal points, there is no maximal change, but some increase, hence, the predicate is atelic.

However, not always the telic DAs result in the maximal change which their closed scale permits. Kearns (2007) argues that the telos

for telic DAs does not need to be a maximum value on the relevant scale. Consider examples in (23):

(23) a. The sky darkened in an hour, but wasn't completely dark.

b. The fruit ripened in five days but wasn't completely ripe.

Both *darken* and *ripen* are derived from the closed scale adjectives which leads them to have default telic reading, hence, the primary reading is the positive one where the finite points of darkness and ripeness were achieved. However, the second part of the sentences with *not completely* modifier in (23) are acceptable, thereby questioning the fact if the maximum degree was reached for these predicates.

In Kennedy and Levin (2008), they argue that the maximum degree of darkness or ripeness in (23) was achieved: all parts of the sky or the fruit underwent the change, but what is denied is that not all parts were dark or ripe completely. Nevertheless, they agree with Kearns that Hay et al. approach has its own flaw and cannot explain how to fix the difference value for the DAs which have telic reading, however, their telos is not the maximum degree on the relevant scale but some contextual standard. Following this approach, it seems that only the DAs derived from the closed scales adjectives can have a base for the fixed degree value as they have the finite points. Thus, the DAs formed from the open scale adjectives cannot have the varied telicity as they do not have the base to which the degree value should be fixed, but as was already showed above their telicity surely can vary.

In other words, the issue with the present approach is that it is possible to set the degree value for the DAs that entail the movement towards the end of the scale, but not possible to set it for the DAs that entail the movement towards some contextual standard, so it does not explain the varied telicity of DAs. The following approach introduced in Kennedy and Levin (2008) aims to improve this one and finally explain why DAs behave in this certain way.

2.3 Kennedy and Levin (2008)

Similarly to Dowty and Abusch, Kennedy and Levin (2008) assume that the meaning for DAs is provided by their core adjectives. What is different: the gradable predicates, according to them, do not denote context-depended properties of the individuals but rather encode the measure functions which associate objects with the ordered values on the scales. For instance, the adjective *cool* denotes a function ***cool*** from objects x to times t that returns the temperature of x at t, and it is degree morphology that converts the function ***cool*** into the adjective *cool*.

2.3.1 *pos* and Interpretive Economy

Comparative morphemes, sufficiency/excess morphemes, different intensifiers and many others occur to be the degree morphemes. However, it is not always the case that a degree morpheme is present overtly, for such positive morphologically unmarked forms with some type of degree meaning there is a null degree head which denotes a function ***pos*** in (24).

(24) $\boldsymbol{pos} = \lambda g \in D_{\langle e,d\rangle} \lambda t \lambda x . g(x)(t) \succeq \boldsymbol{stnd}(g)$

As was mentioned above, x and t are objects and times, g is the function which maps objects to degrees d (***cool*** from *cool*). $\boldsymbol{stnd}(g)$ is also a function from the gradable adjectives meanings to degrees and returns a standard of comparison for the adjective in the context of utterance. In other words, it returns a minimum degree in order 'to stand out' in the context.

To illustrate how it works, consider an application of ***pos*** to a positive form *wide* in (25):

(25) $\boldsymbol{pos}(wide) = \lambda t \lambda x . wide(x)(t) \succeq \boldsymbol{stnd}(wide)$

The standard of comparison $\boldsymbol{stnd}(wide)$ may vary from context to context but $\boldsymbol{pos}(wide)$ will be true when the width of an object x on a time t equals or exceeds the standard $\boldsymbol{stnd}(wide)$. From it follows, the truth of the predicate depends on two factors: the degree to which it manifests the gradable property measured by the adjective (width in

this case) and the actual value of the standard of comparison in the context, so the value returned by ***stnd***(*wide*).

It is further noted that ***stnd***(g) is the function both of features of conventional meaning of adjectives and of features of contexts. And how it was already argued before, some gradable adjectives have conventional meanings fixed with regard to the structure of their scales — relative and absolute, open or closed from both ends or one end. Therefore, the standard of comparison for adjectives with the closed scale corresponds to an end point: for some cases it is minimum (*open, bent, impure*), for others the maximum (*straight, closed, pure*). Hence, the standard of comparison for such adjectives is not context-dependent.

The standard of comparison ***stnd***(*dry*) is fixed by its upper-closed scale, ***stnd***(*wide*) is context dependent as *wide* is an open scale adjective, so *dry* is absolute and *wide* is a relative adjective. The difference between them, according to Kennedy and Levin (2008), is that the absolute have 'natural transitions': the transition from having zero degree to having some degree for lower-closed scales, and from having some degree to the maximum for upper-closed scales. The final result from these transitions (some degree for lower-closed and maximum for upper-closed) is what means to 'stand out'.

To explain why absolute adjectives have their maxims as standards, Kennedy and Levin follow a principle of Interpretive Economy which is stated in (26):

(26) *Interpretive Economy*
Maximize the contribution of the conventional meanings of the elements of a sentence to the computation of its truth conditions.

As far as the closed scale adjectives have the conventional meaning fixed which was provided by natural transitions, the contextual meaning is a 'last resort' for them, so less favorite. And since the open scale adjectives lack natural transitions, they do not inherit any conventional meaning and use the contextual factors as the standards of comparison to show how much the measured property stands out.

To sum up above, absolute adjectives, according to Interpretive Economy principle, have the conventionally fixed standards by their scales, so ***pos*** will return these standards; relative ones need ***pos*** as it

supplies them with the standard from the context. Kennedy and Levin employ these concepts further to explain why DAs have the varied telicity.

2.3.2 Semantics of DAs and varied telicity

Unlike the previous approaches, Kennedy and Levin do not treat the adjectival part of the meaning as the core meaning of DAs, instead they propose that there is a special kind of the difference function inside responsible for it. This function measures what was the amount of change along a scalar dimension that an object had while participating in an event. Their proposal is stated in (27):

(27) *Measure of change*
For any measure function $\boldsymbol{m}$,
$\boldsymbol{m}_{\Delta} = \lambda x \lambda e.m^{\uparrow}_{m(x)(init(e))}(x)(fin(e))$

(27) is untangled as following. $\boldsymbol{m}_{\Delta}$ is a measure of change function which takes an object x and an event e, and then it returns the degree that represents the amount x has changed in the property measured by $\boldsymbol{m}$. $\boldsymbol{m}$ is a measure function from the objects x and times, in this case it is the beginning of the event $init(e)$, it returns the degree on a scale S (e.g., length, weight, or width domains). $\boldsymbol{m}^{\uparrow}$ is a difference function which is the same as $\boldsymbol{m}$, except that the degree it returns for the objects is set between the object's projections on the scale (again length, weight, width etc.) and the degree at the beginning of the event provided by $\boldsymbol{m}$. At the end, there is the degree representing the positive difference between the degree to which x measures $\boldsymbol{m}$ at the beginning of e, $(init(e))$, and the degree to which it measures $\boldsymbol{m}$ at the end of e, $fin(e)$; if there is no positive difference, it returns zero (Kennedy and Levin 2008).

In (27), Kennedy and Levin introduced semantics of the adjectival core of DAs, however, it needs to be shifted in order to end up with the property of events, hence, to end up as a verb. They assume that a verbal version of the null morpheme $\boldsymbol{pos}$ — $\boldsymbol{pos}_{v}$, in combination with the measure of change function $\boldsymbol{m}_{\Delta}$ finally makes the core meaning of DAs themselves, the semantics properties stated in (28).

(28) $\boldsymbol{pos}_v(m_\Delta) = \lambda x \lambda e.m_\Delta(x)(e) \succeq \boldsymbol{stnd}(m_\Delta)$

To make it more or less clear, consider the following examples of the DAs *to straighten* and *to widen* in (29):

(29) a. $\boldsymbol{pos}_v(straight_\Delta) = \lambda x \lambda e.straight_\Delta(x)(e) \succeq \boldsymbol{stnd}(straight_\Delta)$

b. $\boldsymbol{pos}_v(widen_\Delta) = \lambda x \lambda e.widen_\Delta(x)(e) \succeq \boldsymbol{stnd}(widen_\Delta)$

The adjective *straight* is an absolute adjective, so a measure function ***staight*** which maps the objects to degrees is oriented to the maximum on the scale which is considered to be its standard. $\boldsymbol{straight}_\Delta$ is a measure of change function and it inherits this adjectival scale and then with $\boldsymbol{pos}_v$ applied forms the verb *to straighten*. The same conveys to *wide* but with one significant difference: *wide* is a relative open scale adjective, so $\boldsymbol{wide}_\Delta$ receives the scale without any conventional standard and have the standard fixed by the context.

Kennedy and Levin further assume that all DAs, even those based on the open scale adjectives, have a minimum value — a degree provided by $\boldsymbol{m}$ at the beginning of the event, hence, $\boldsymbol{m}_\Delta$ has it as well. So, DAs like *to straighten* have the minimum which is the initial degree of the object and the maximum which is fixed by the scale of *straight* adjective; however, DAs of *to widen* type have only the minimum determined by $\boldsymbol{m}$. This is crucial for the approach as it directly affects varied telicity of DAs and solves the issue from Hay et al.

Since all DAs have a minimum element, therefore they all can easily allow the comparative atelic reading. The positive telic is available only if $\boldsymbol{m}_\Delta$inherits a maximal element which is not happening in case of the open scale adjectives, consequently, *to widen* does not allow 'to become wide' reading.

Nonetheless, *to cool* from the very first example in this chapter (12) is a DAs based on a relative open scale adjective and it allows both readings. Kennedy and Levin assume that it happens because their analysis permits some other aspects of conventional meaning beside the scale structure to intrude into the DAs meaning. In this particular case, *cool* "has purely conventionalized meaning" (Kennedy and Levin 2008, p. 22), e.g., at room or some stabilized temperature, so the telos was not the scalar maximum but one of these additional norm-based

meanings. However, Kennedy and Levin suppose that such cases are rare and generally other DAs fall under the outlined analysis.

To summarize the approach, consider the following points below. DAs based on adjectives with:

- totally open scale inherit the initial point, however, since they do not posses any final point, they are interpreted as atelic by default; *cool* is an exception as described above;
- upper-closed scales are interpreted as telic, because they inherit both the initial and final point;
- lower-closed scales have only the initial point, hence, they are atelic by default;
- totally closed scales have both points, so as the upper-closed, they are interpreted as telic.

The approach by Kennedy and Levin explains in the appealing way why English DAs might have the varied telicity. However, the present work does not finish at this point, which means there are some additional issues to be addressed. One of them is that DAs do not behave uniformly in all languages, therefore all above is not necessarily true for them. For instance, Japanese DAs seem to be derived from the open scale adjectives, but they behave as telic (Kawahara 2017).

Another mismatches come from Slavic: from a totally closed adjective *prázdný* 'empty' can be formed two DAs – *uprázdnit* and *vyprázdnit*. According to the telicity tests, the former is atelic, while the latter is telic, however, following the approach, the telic should be default for it (Dočekal and Vlášková 2020). Moreover, there are also the telic and atelic DAs based on open and lower-closed adjectives: Russian *gorjačij* 'hot' – *razogreť* is telic, *pogreť* is atelic; Czech *vlhký* – *provlhnout* is telic, *navlhnout* is atelic.

Therefore, in the further section, it will be discussed how Japanese DAs differ from English. Then in the next chapter, Slavic DAs will be described in greater detail because they do not exactly follow Kennedy and Levin scheme either.

2.4 Japanese DAs

Kawahara (2017) points out that Japanese DAs are derived from i-adjectives with a derivational morpheme *-maru*. Almost all i-adjectives are the open scale adjectives, however, the morpheme *-maru* turns adjectives into the intransitive verbs which are compatible with *in*-adverbials, but not with *for*.

(30) a. *Enzin-ga {??jup-pun-kan, jup-pun-de} atatamat-ta.*
engine-NOM ten-minutes-for ten-minutes-in warm-PST
'The engine warmed {for, in} ten minutes.'

b. *Kawa-(haba)-ga {??juu-nen-kan, juu-nen-de} hirogat-ta.*
river-(width)-NOM ten-years-for ten-years-in widen-PST
'The river widened {for, in} ten years.'

A progressive form of the derived DAs also does not entail that the event was finished, consider the examples in (31):

(31) a. *Enzin-ga atatamata-te iru. ⇏ Enzin-ga atatamat-ta.*
engine-NOM warm-TE IRU engine-NOM warm-NOM
'The engine is warming. The engine has warmed.'

b. *Kawa-(haba)-ga hirogat-te iru ⇏ Kawa-(haba)-ga hirogat-ta.*
river-(width)-NOM widen-TE IRU river-(width)-NOM widen-PST
'The river is widening. The river has widened.'

Beside the examples in (30) and (31), Kawahara provides several different arguments why Japanese DAs are telic by default. For instance, it is argued that a combination of a *tokoro-da* 'place-copular' phrase, which is a counterpart of English *almost*, with DAs is ambiguous between two readings. One interpretation describes an event that does not occur at all, while the other interpretation is that an event has begun but is not yet terminated. It is opposed to an activity verb *hasiru* 'run' which is atelic and allows only the first reading.

(32) a. *Enzin-ga atatamaru tokoro-da. (Mada tumetai kedo.)*
engine-NOM warm place-COP still cold though
'(Lit.) The engine almost warms. (It is still cold though.)'

b. *Enzin-ga hasiru tokoro-da.*
engine-NOM run place-COP
'The engine almost runs.'

Kawahara then concludes that even though Japanese DAs are derived from the open scale adjectives which do not posses any end points, these verbs are telic. It does not quite match with Kennedy and Levin as they predict atelic reading for DAs based on the open scale adjectives. Moreover, it seems like the Dowty/Abusch approach where they argue that inside DAs there is the *BECOME* operator is more applicable to Japanese. However, Kawahara does not adopt this operator and provides a proposal that explains the telic behaviour of Japanese DAs.

One of the reasons why the approach of Dowty and Abusch is not applicable, is that Japanese DAs are compatible with degree modifiers and measure phrases, therefore they are measurable and gradable. Intensifiers that are compatible with the open scale adjectives, are also felicitous with DAs, consider the examples in (33) with *totemo* 'very'.

(33) a. *Enzin-ga totemo atatamat-ta. Enzin-ga totemto atatakai.*
engine-NOM very warm-PST engine-NOM very warm
'The engine warmed very much. The engine is very warm.'

b. *Kawa-(haba)-ga totemo hirogat-ta. Kawa-(haba)-ga totemo*
river-(width)-NOM very widen-PST river-(width)-NOM very
hiroi.
wide
'The river widened very much. The river is very wide.'

And in (34), the examples of DAs together with the measure phrases, and it also proves that DAs are measurable based on the scale.

(34) a. *Enzin-ga go-do atatamat-ta.*
engine-NOM five-degrees warm-PST
'The engine warmed by five degrees.'

b. *Kawa-(haba)-ga go-meetoru hirogat-ta.*
river-(width)-NOM five-meters widen-PST
'The river widened very much.'

Kawahara hypothesizes that the standard of Japanese DAs is fixed and cannot be shifted, that is why all DAs are telic by default. In (35), there is the meaning of *atatamaru* where ***stnd*** is stable.

(35) a. $[\![atatamaru]\!] = \lambda d\lambda x\lambda e.\boldsymbol{warm}(x)(e) = d$

b. $[\![\boldsymbol{pos}_v]\!] = \lambda G\lambda x\lambda e.\exists d[\boldsymbol{stnd}(d)(G)(C) \wedge G(d)(x)(e)]$

c. $([\![\boldsymbol{pos}_v]\!][\![atatamaru]\!]) = \lambda G\lambda x\lambda e.\exists d[\boldsymbol{stnd}(d)(G)(C) \wedge G(d)(x)(e)](\lambda d\lambda x\lambda e.warm(x)(e) = d)$
$= \lambda x\lambda e.\exists d[\boldsymbol{stnd}([\![warm]\!]) \wedge \boldsymbol{warm}(x)(e) = d]$

From above follows, that Japanese DAs derived from the open scale adjectives should be atelic following Kennedy and Levin, but apparently they do not care much about the adjectival scales, moreover, it looks like they behave in sense of Dowty/Abusch and posses the *BECOME* operator. However, Kawahara rejects it and demonstrates that Japanese DAs are gradable. They probably have the fixed standard on the scale by which they measure the change of state resulting in the telic reading.

Conclusion In this chapter, I discussed the formal approaches for DAs analysis. The first was suggested by Dowty (1979) and further developed by Abusch (1985), where they claim that the varied telicity of DAs is caused by the vague base of adjectives. The approach is not convincing as it has several flaws: firstly, it is argued that all DAs are both telic and atelic by default which it not necessarily true; secondly, it is not possible to fit the measure phrases into it.

The second approach was introduced by Hay et al. (1999), where it was argued that DAs inherit the adjectival scales either open or closed and it affects their telicity. They also fix one of the Abusch's issues, namely the combination with the measure phrases and deliver the difference value d. However, the approach is not ideal and cannot fix the difference value d to some contextual standard as only closed scale adjectives have the initial and end points.

The third approach by Kennedy and Levin (2008) is an improved version of the previous one. Here DAs inherit the adjectival structure as well, however, in addition to this, they also inherit a minimum value regardless their open or closed structure. DAs derived from the closed scale adjectives with their conventionally fixed standards might result in the telic reading, however, DAs based on the open scale adjectives inherit only the minimum value, and thus cannot allow 'to become x' reading.

But not all languages behave that way. In the last section of this chapter, I discussed Japanese DAs: they appear to be telic although based on the open scale adjectives. Kawahara (2017) argues that they all have a fixed standard resulting in the telic reading. Slavic DAs do not fit in the outlined scheme either and it is the subject of the following chapter.

3 Slavic degree achievements

The morphological forms of verbs vary from one language to another, nevertheless, there is an obvious pattern in Slavic. In this chapter, I will describe Slavic verbs using the data from the different languages, although in general they tend to behave similarly, unless it is not mentioned explicitly. Then I will focus on Slavic DAs and outline their structure as it will be useful further in the next chapter.

3.1 Morphology and aspect

Medová and Wiland (2019) provide the following scheme of Czech in (36):

(36) a. (PREFIX)-ROOT-THEME-PARTICIPLE-AGR

b. *z-bour-a-l-a*
PREFIX-demolish-AJ-L-F.SG
'(she) demolished (it completely)'

c. *z-bour-á-n-o*
PREFIX-demolish-AJ-N-N.SG
'(it was) demolished (completely)'

A stem is derived from a lexical root by the different prefixes and/or suffixes. Verbs are also inflected for tense, mood, person, number, and gender. Affixes and inflection may undergo some phonological processes, e.g., the vowel alternation or consonant mutation (Filip 1993; Medová and Wiland 2019; Smith 1997).

The root either prefixed or not, is then followed by a so-called THEME SUFFIX that contributes to the argument structure of the verb stem. After the theme, there is a participial suffix: either active (non-present) L or passive N/T. At the end there is an AGR marker that indicates a subject agreement in gender and number. Neither the form of the participle or AGR contribute to the aspectual meaning of the verb (Medová and Wiland 2019).

Aspectual information for the Slavic verbs is usually provided by prefixes or suffixes, so all verbal forms can be classified as perfect or imperfect. This distinction is commonly seen as an instance of viewpoint aspect. The majority of morphologically simple verbs are imperfect, however, some might be perfect, e.g, *dať* 'to give'. If a verb undergoes prefixation, it is then perfect. But after prefixation, the verb may combine with an additional suffix ova[1] and the output is imperfect again. Some verbs also allow an additional prefix on top of the already existing prefix and it may lead to the aspectual change (Filip 1993; Gehrke 2008). The examples of such modifications for Russian are in (37a), for Czech in (37b-c).

(37) a. impf. *pisať* 'to write' → pf. *pod-pisať* → impf. *pod-pis-yva-ť* → pf. *po-pod-pis-yva-ť*

b. impf. *pracovat* 'to work' → pf. *vy-pracovat* → impf. *vy-pracov-áva-t*

c. pf. *od-stoupit* 'to atep aside' → pf. *po-od-stoupit*

Both prefixes and suffixes play an important role in formation of Slavic verbs, so in the following subsections I will elaborate on them a bit more.

3.1.1 Prefixes

Prefixes contribute to the argument structure or case-assignment, can change the meaning of the verb, they also affect telicity and prefectivity (Biskup 2019). Verbal roots in Slavic may combine with many prefixes that receive a wide range of interpretations, the whole list is hard to name but several interpretations are present below (Kagan 2013):

- spatial (crossing, approaching, entering)
- aspectual (inchoative, completive, iterative)

1. Following Medová and Wiland (2019), I will refer to the theme suffixes as ova, aj, e, ej, nu and i because (i) there might be several different suffixes doing 'one thing' in one language, e.g., Russian *-yva-*, *-v-*, or ∅ for the secondary imperfection; (ii) they all exist in Slavic but in the different forms, so henceforth, ova, aj, e, ej, nu and i represent morphemes of the theme suffixes.

- temporal (delimitative)
- quantificational (diminutive, accumulative)

Prefixes may vary in terms of additional properties, such as productivity or compositionality, some of them may add straightforward interpretations, while others may create idiomatic meanings. Also even one prefix might have several different meanings, e.g., a prefix *pod-* which can be translated into English as 'under': *pod-bežať* 'approach by running', *pod-prygnuť* 'jump upward', *pod-tajať* 'melt incompletely', *pod-smotreť* 'to peep', *pod-kinuť* 'to toss, flip' (Kagan 2013).

The prefixes *po-* and *pro-* form the perfect activity verbs in Russian, so the verbs with them are dynamic, durative and atelic. *Pro-* 'through' conveys limited duration, e.g., *stojať* is imperfect 'to stand' and *pro-stojať* 'to stand for some time'. *Po-* 'along, on' expresses a shorter duration than was expected, e.g., *pisať* is imperfect 'to write', *na-pisať* is perfect, but *po-pisať* is perfect but atelic translated as 'to write for a while'. However, both can be found in the telic events: *pro-čital knigu* 'read a book' is a telic event, *pro-čitať* is the perfect counterpart of imperfect *čitať* 'to read'; *po-stupil v universitet* is a telic event 'entered the university' (Gehrke 2008; Smith 1997).

There are some obvious mismatches of how prefixes affect aspect in Slavic, so it is argued that they do not mark perfectivity or telicity all uniformly. The arguments are the following: (i) there are perfect verbs without prefixes and imperfect with prefixes; (ii) in some cases prefixes shift lexical meaning of the verbs; (iii) according to different telicity tests, there are prefixed verbs that can behave both telic and atelic. In order to provide a solution to this, prefixes might be divided into internal and external, this distinction is also known as lexical and superlexical (Biskup 2019; Gehrke 2008).

The difference between them is that unlike lexical, superlexical do not change meaning of verbs but affect the course of events. The lexical prefixes trigger some change in the argument structure of verbs. They have a spatial or idiosyncratic meaning, so the verbs with them receive both compositional and non-compositional meanings; while the superlexical prefixes have an adverbial or quantising meaning, so the verbs with this type on end up having only the compositional meaning (Biskup 2019; Gehrke 2008; Ramchand 2004).

Biskup (2019) provides several examples from the different Slavic languages, some of them follow. In (38a), there is the Russian inceptive *za-* 'behind', the Polish repetitive *prze-* 'over' in (38b), the cumulative/saturative *na-* 'on' together with the verbs from Slovenian and Czech in (38c-d). All prefixes are considered to be superlexical.

(38) a. *za-boleť, za-begať* *Russian*
behind-be.ill, behind-run
'to become ill, to start running'

b. *prze-robić, prze-pisać* *Polish*
over-do, over-write
'to rework, to rewrite'

c. *na-běhat se* *Czech*
on-run REFL
'to come to have one's fill of running'

d. *na-laufati se* *Slovenian*
on-run REFL
'to come to have one's fill of running'

The prefixes in (39) are lexical. All the verbs have the spatial prefixes on, either *na-* 'on' or *v-* 'in'.

(39) a. *na-bàcati* *Serbo-Croatian*
on-throw
'to throw something on something'

b. *na-malować* *Polish*
on-paint
'to paint something on something'

c. *v-liať* *Slovak*
in-pour
'to pour something into something'

d. *v-nést* *Czech*
in-carry
'to carry something into something'

e. *v-pisať* *Russian*
in-write
'to write something into something'

It is argued that there are some obvious similarities between prefixes and prepositions. It actually might explain why some verbs with the prefixes end up in the compositional meaning, i.e., meaning of such derived verbs could be understood from meaning of their lexical roots and meaning of the corresponding to prefixes prepositions (Biskup 2019; Gehrke 2008; Ramchand 2004). Some of prepositions and prefixes are compared in Table 3.1.

Table 3.1: Goal and source prepositions and prefixes (Gehrke 2008)

	Czech		Russian	
meaning	prepositions	prefixes	prepositions	prefixes
to	*do, k*	*do-, při-*	*do, k*	*do-, pri-*
towards	*k, vůči*	–	*k*	–
into	*do*	*do-*	*v*	*v-*
on/onto	*na*	*na-*	*na-*	(*na-*)
away (from)	*od*	*od-, u-*	*ot*	*ot-, u-*
out (of)	*z*	*vy-*	*iz*	*iz-, vy-*

There are some mismatches, however, they can be explained from the diachronic point of view. Moreover, it is argued that verbal prefixes and prepositions belong to the same category not only in Slavic but also in Germanic, Hungarian and others (Asbury et al. 2006; Gehrke 2008).

Since it was established that prepositions and prefixes are related in some sense, let me for a moment turn to prepositions. Zwarts (2005) argues that analogous verbs, it is possible to distinguish bounded

and unbounded prepositions, i.e., telic and atelic. He proposes the following distinction:

- *Bounded, telic*: to, into, onto, from, out of, off, away, from, past, via
- *Unbounded, atelic*: towards, along
- *(Un)bounded, (a)telic*: across, around, down, over, through, up

In English, telicity of preposition is transferred to the whole verbal phrase, consider the examples in (40): *walk* itself in (40a) is interpreted as atelic, but when it is combined with a directional preposition *to* in (40b), the result is telic. In (40c), there is an unbounded directional preposition *along* and *walk* is again interpreted as telic (Dočekal and Vlášková 2020).

(40) a. Peter walked {*in, for} two hours.

b. Peter walked to the pub {in, *for} two hours.

c. Peter walked along the river {*in, for} two hours.

Zwarts (2005) assumes that telicity of prepositions depends on whether their trajectories are concatenatable or not. Similarly to *push a cart* and *eat an apple* from subsection *Aspect* in Chapter 1, every path of *along the river* falls under it, and thus they can concatenate. But it does not equally apply to *into the house* where there is a final point and its paths cannot be joined into one. For a further discussion, see Zwarts (2005).

If one returns back to prefixes and DAs, it is clear that it can be applied to their analysis. Dočekal and Vlášková (2020) suggest that this might shed some light on the DAs telicity puzzle in Slavic. They assume that the prefixes which denote bounded trajectories make Czech DAs telic and, crucially, it holds for all DA classes in despite of their core adjectival scale.

3.1.2 Suffixes

Medová and Wiland (2019) mention that besides the theme suffix ova, there are several different suffixes that may affect the aspectual

structure of Slavic verbs, namely situation types. For instance, the theme E can be found in statives and in a group of verbs related to perception or production of sound, consider the examples from Czech and Polish in (41):

(41) a. *Jan sed-ě-l v křesle.* *Czech*
Jan sit-E-PST.M.SG in chair
'Jan sits in a chair.'

b. *My nie chcemy o tym słysz-e-ć.* *Polish*
we not want about it hear-E-INF
'We don't want to hear about it'

The other theme prefixes AJ, I and already mentioned OVA form activities, consider them in (42). The suffix I is also a typical element of causative verbs.

(42) a. *Jan sed-a-l v čele.* *Czech*
Jan sit-A-PST.M.SG in front
'Jan used to sit in a front.'

b. *Wierni klek-aj-ą na mszy.* *Polish*
worshippers kneel-AJ-PRES.PL at mass
'Worshippers kneel at a mass.'

c. *Jan pře-saz-ova-l kytky.* *Czech*
Jan over-sit-OVA-PST.M.SG flowers
'Jan replanted flowers.'

d. *Jan kup-owa-l kwiaty.* *Polish*
Jan buy-OVA-PST.M.SG flowers
'Jan was buying flowers.'

e. *Jan po-sad-i-l dítě na stůl.* *Czech*
Jan on-sit-I-PST.M.SG child on table
'Jan made the child sit on the table.'

f. *Jan po-sadz-i-ł dziecko na stole.* *Polish*
Jan on-sit-i-pst.m.sg child on table
'Jan made the child sit on the table.'

Smith (1997) and Medová and Wiland (2019) mention that the theme suffix nu is responsible for perfect viewpoint aspect and can be found in semelfactives as in (43).

(43) a. *On stuk-nu-l v dver'.* *Russian*
he knock-nu-pst.m.sg at door
'He knocked at the door'

b. *Jan si sed-nu-l.* *Czech*
Jan REFL sit-nu-pst.m.sg.
'Jan sat down.'

c. *Ogeń buch-ną-ł.* *Polish*
fire burst-nu-pst.m.sg.
'The fire burst out.'

What is also interesting, the same suffix nu can also derive DAs, the examples from Medová and Wiland (2019) in (44).

(44) a. *Petr hloup-nu-l.* *Czech*
Petr stupid-nu-pst.m.sg.
'Petr was getting more and more stupid'

b. *Ogeń gas-ną-ł.* *Polish*
fire douse-nu-pst.m.sg.
'The fire was dying out.'

In addition to nu, the theme suffix ej also forms DAs, consider the examples in (45):

(45) a. *Jan ze-šed-iv-ě-l.* *Czech*
Jan from-grey-iv-ej-pst.m.sg.
'Jan has turned grey.'

b. *Metal rdz-ewi-ej-e.* *Polish*
metal rust-iv-ej-m.sg.
'Metal rusts.'

c. *Listja na derevjax po-želt-e-li.* *Russian*
leaves on trees on-yellow-ej-pst.pl
'The tree leaves turned yellow.'

According to Medová and Wiland (2019), the difference between DAs and semelfactives is that the former are derived from adjectival roots while the latter come from nominal roots. The examples follow down below.

(46) DAs:

a. *tmav-ý* → *tmav-nou-t* *Czech*
dark$_{ADJ}$ darken$_{INF}$

b. *trpk-ý* → *trpk-nou-t* *Czech*
bitter$_{ADJ}$ get-bitter$_{INF}$

c. *gorzk-i* → *gorzk-ną-ć* *Polish*
sour$_{ADJ}$ become-sour$_{INF}$

d. *głuch-y* → *głuch-ną-ć* *Polish*
deaf$_{ADJ}$ become-deaf$_{INF}$

(47) Semelfactives:

a. *písk* → *písk-nou-t* *Czech*
whistle$_{N}$ whistle-once$_{INF}$

b. *klik* → *klik-nou-t* *Czech*
click$_{N}$ click-once$_{INF}$

c. *krzyk* → *krzyk-ną-ć* *Polish*
scream$_{N}$ scream-once$_{INF}$

d. *kop* → *kop-ną-ć* *Polish*
kick$_{N}$ kick-once$_{INF}$

NU also disappears in certain forms of participles for both of them: for L-participles, it pops up only in the singular masculine form, but not in the other singular and plural forms. Consider the following examples from Czech, some speakers retain and do not mind NU, but others prefer it to be removed.

(48) a. *bled-(nu)-l*
pale-(NU)-L.m.sg

b. *bled-(?nu)-l-{a, i, o}*
pale-(?NU)-L-other
'get pale'

(49) a. *kop-(nu)-l*
kick-(NU)-L.m.sg

b. *kop-(?nu)-l-{a, i, o}*
kick-(?NU)-L-other
'give a kick/kick once'

Medová and Wiland point out some additional observations regarding NU and semelfactives, however, I will stop here as the present work examines DAs. For a further discussion, see Medová and Wiland (2019).

Since the needful morphological preliminaries were stated, in the next section, I will finally jump into the description of the Slavic DAs.

3.2 Czech and Russian DAs

Unlike Japanese DAs, which were discussed in the previous chapter in section *Japanese DAs*, Slavic DAs can be derived from adjectives with different scales. In this section, I will outline some known facts about Slavic DAs, how they are formed and differ from English.

In Švedova (1982), it is mentioned that the majority of Russian verbs with suffixes is derived from other verbs, nouns, or adjectives. Verbs can be also derived from numerals, pronouns, adverbials, or interjection, but these cases are rare. Since the present work focuses on

Table 3.2: Russian deadjectival verbs (Švedova 1982)

suffix	adjectives	verbs
-i-	*glupyj* 'stupid' *faľšivyj* 'fake' *suchoj* 'dry'	*glupiť* *faľšiviť* *sušiť*
-ova-	*pustoj* 'empty' *stabiľnyj* 'stable'	*pustovať* *stabilizirovať*
-iča-	*žadnyj* 'greedy' *otkrovennyj* 'frank'	*žadničať* *otkrovenničať*
-stvova-	*mudryj* 'wise' *svirepyj* 'ferocious'	*mudrstvovať* *svirepstvovať*
-a-	*krepkij* 'sturdy'	*krepčať*
-e-	*slabyj* 'weak' *želtyj*'yellow'	*slabeť* *želteť*
-nu-	*gluchoj* 'deaf'	*glochnuť*

deadjectival verbs, in Table 3.2 there is a list of the suffixes that make verbs from adjectives and several examples from Švedova (1982).

From Table 3.2 follows that deadjectival verbs can have three possible meanings:

(a) execute an action that is inherent to someone/something possessing a property of a base adjective: *glupiť* 'to behave like a person who is stupid'; *žadničať* 'to behave like a greedy person';

(b) execute an action that can be characterized by a base adjective: *faľšiviť* 'to do something falsely or incorrect, to fake'; *otkrovenničat* 'to be frank';

(c) assign a property of a base adjective to someone/something: *sušiť* 'to make dry'; *slabeť* 'to become weak'.

Apparently, there are some restrictions because not all adjectives have corresponding verbs, e.g., *rezkij* 'sudden, sharp', *lišnij* 'useless, excess', *jarkij* 'bright' etc. What is interesting, the direct verb from

Table 3.3: Czech deadjectival verbs (Lehečková 2011)

suffix	adjectives	verbs
-nou-	*mladý* 'young'	*mládnout*
	bohatý 'rich'	*bohatnout*
	slepý 'blind'	*slepnout*
-ě-	*smutný* 'sad'	*smutnět*
	růžový 'pink'	*růžovět*
	tupý 'blunt'	*tupět*
-a-	*černý* 'black'	*černat (se)*
	rovný 'straight'	*rovnat (se)*
	zelený 'green'	*zelenat (se)*
-i-	*vlhký* 'wet'	*vlhčit*
	suchý 'dry'	*sušit*
	špatný 'bad'	*horšit se*
	veselý 'cheerful'	*veselit se*

raznyj 'different' is *raznitsja*, but there is also a verb *raznoobraziť* 'to make diverse' with the meaning based on the mentioned adjective, but with an additional noun *obraz* 'image'. An adjective *raznoobraznyj* 'diverse' exists and is very frequent. The similar situation with a verb *utixomiriť* 'to calm down' based on an adjective *tixij* 'quiet' and a noun *mir* 'peace'; an adjective *tixomirnyj* is possible but not very frequent, however, there are also some verbs directly derived from *tixij*, e.g., *tixnuť, zatixnuť*.

Some adjectives allow to derive verbs but their usage is not frequent, they are possible but not completely felicitous: *udobnyj* 'comfortable' → *??udobničať*, *bujnyj* 'violent' → *??bujničať*, *opasnyj* 'dangerous' → *??opasničať*.

Czech deadjectival verbs also can be classified by the suffixes. There are some examples in Table 3.3.

Lehečková (2011) mentions that in Czech tradition the following meanings can be found for deadjectival verbs (which are quite similar to Russian):

(a) express an inchoative, non-active transformation to a state that a base adjective denotes: *mládnout* 'to become young'; *růžovět* 'to become pink'; *černat* 'to become black';

(b) cause a transformation to a state that a base adjective denotes: *vlhčit* 'to make wet'; *sušit* 'to make dry';

(c) express a manifestation of a property that a base adjective denotes: *smutnět* 'to be sad'; *veselit se* 'to have fun'.

In the previous section, it was noticed that the theme suffix I is usually responsible for causative activity verbs, it fits to the list of DAs meanings, e.g., *sušit* 'to make dry'. Also there is the theme AJ which is responsible for activities, it also corresponds with some of DAs meanings, e.g., *krepčať* 'to get sturdy' is an atelic activity. The theme prefix OVA is available for DAs too and it forms the secondary imperfective verbs, e.g., *snížit* 'to lower' is perfect from an adjective *nízký* 'low' while *snížovat* is imperfect.

It looks like the theme prefix NU is a bit more productive in Czech than in Russian when it concerns DAs. The Czech examples from Table 3.3 *mládnout* 'to get younger', *bohatnout* 'to get richer' and some additional like *stárnout* 'to get older', *chudnout* 'to get poorer' have Russian counterparts but with the theme suffix EJ, i.e., *molodeť, bogateť, stareť, bedneť* respectfully.

Lehečková (2011) also mentions that some originally deadjectival verbs now have the shifted meanings and are not gradable anymore: *jistý* 'certain' → *zjistit* 'to find out', *zajistit* 'to ensure'; *tvrdý* 'hard' → *tvrdit* 'to claim'; *pustý* 'deserted' → *opustit* 'to leave'; *živý* 'alive' → *živit* 'to support'. The same can be found in Russian: *polnyj* 'full' → *ispolniť, vypolniť* 'to fulfill'; *tverdyj* 'hard' → *utverdiť* 'to approve'.

When it comes to prefixes, DAs start to behave in a very peculiar way. Some of them are fine without any prefix on, but allow prefixation. For instance, there are four different verbs from an adjective *xudoj* 'thin' – *xudeť*, *po-xudeť*, *s-xudnuť*, *is-xudať*. However, another part of Slavic DAs is either ungrammatical or less acceptable without prefixes: **lučšiť*, *?niziť*, *?menšiť*, **složniť*, **prázdnit* etc. It applies equally for Czech and Russian DAs.

Lehečková (2011) mentions that in Czech the most productive DA prefix is *z(e)-* 'from'. In Russian, it is a prefix *u-* 'at', sometimes they can be found in the same DAs, but not always. In (50), there are several examples of their usage.

(50)

	adjective	*Czech*	*Russian*
a.	strong	ze-sílit	u-siliť
b.	small	z-mešit	u-menšiť
c.	big	z-většit	u-veličiť
d.	good	z-lepšit	u-lučšiť
e.	short	z-krátit	u-korotiť
f.	rich	z-bohatnout	raz-bogateť
g.	thin	z-hubnout	po-xudeť
h.	high	z-výšit	po-vysiť

If DAs allow several prefixes, e.g., *o-, na-, vy-, pro-, po-, s-* etc., it might affect their telicity. It seems that it does not really matter what type of scale an adjective has, if a prefix is considered to be telic according to the telicity tests, a DA with it on will have the telic meaning; the same applies for the atelic prefixes, DAs with them will probably have the atelic interpretation. This does not quite fit into Kennedy and Levin's approach as they predict the atelic reading for DAs based on the lower-closed and totally open adjectives, while despite the scales Slavic DAs can have both readings because of the prefixes.

The classical telicity test with *in-/for*-adverbials is generally not very indicative: perfect DAs with prefixes combine with *in*-adverbials, however, there are some exceptions. Some perfect verbs with the atelic prefixes on might end up either with both *in-/for*-adverbials or with *for-* only. One of them is the verb *soxnuť* and its forms in (51) based on the upper-closed adjective *suxoj* 'dry'.

(51) a. *Rubaška soxla {dva časa, *za dva časa}.*
shirt dry-PST.F.SG two hours, in two hours
'The shirt dried {for two hours, in two hours.}'

b. *Rubaška vy-soxla {*dva časa, za dva časa}.*
shirt out-dry-PST.F.SG two hours, in two hours
'The shirt dried {for two hours, in two hours.}'

c. *Rubaška po-soxla* {*dva časa*, **za dva časa*}.
shirt on-dry-PST.F.SG two hours, in two hours
'The shirt dried {for two hours, in two hours.}'

In (51a), there is an imperfect verb *soxnuť*, it is grammatical with a *for*-adverbial *dva časa* and ungrammatical with *za dva časa* which is an *in*-adverbial. Then the opposite case follows: the perfect DA with the prefix *vy-* in (51b) accepts *za dva časa* but does not accept *dva časa*. However, in (51c), *po-soxnuť* even though it has the prefix, it behaves in the same manner as the unprefixed imperfect *soxnuť*.

Another example of such inconsistency comes from *gorjačij* 'hot' and its DAs in (52).

(52) a. *Sup grelsja* {*5 minut*, **za 5 minut*}.
soup hot-PST.M.SG-REFL 5 minutes, in 5 minutes
'The soup warmed {for 5 minutes, in 5 minutes.}'

b. *Sup razo-grelsja* {**5 minut*, *za 5 minut*}.
soup out-hot-PST.M.SG-REFL 5 minutes, in 5 minutes
'The soup warmed {for 5 minutes, in 5 minutes.}'

c. *Sup po-grelsja* {*5 minut*, *?za 5 minut*}.
soup on-hot-PST.M.SG-REFL 5 minutes, in 5 minutes
'The soup warmed {for 5 minutes, in 5 minutes.}'

As it was mentioned above, this behavior is intrinsic to the prefix *po-* and it might derive activity verbs. However, according to the other tests, perfect DAs with the different prefixes on might end up in both telic and atelic interpretations. In order to illustrate it, Dočekal and Vlášková (2020) extracted from the Czech national corpus (Křen et al. 2015) the prototypical ways of prefixation of the four classes of Czech DAs. They focused on the prefixed perfect DAs as it seems that they represent the majority of Czech DAs. The verbs were interpreted as telic or atelic based on the following tests:

1. contradiction test: if a DA in the first part of a sentence is atelic, it will not contradict the second part of the sentence where there is its core adjective; e.g., *The creek has widened, but it was not wide*;

otherwise, if a DA is telic, it will lead to a contradictions, e.g., *The rod has straightened, #but it was not straight.*;

2. progressive → perfect test: the atelic DAs allow entailment from progressive to perfect tense, e.g., *x is widening → x has widened*, while the telic do not, e.g., *x is straightened → x has straightened*; for the Czech data, Dočekal and Vlášková (2020) used the imperfect → perfect test as an equivalent entailment pattern.

Dočekal and Vlášková (2020) provide the examples of all four DA classes with both atelic and telic prefixes. They start with the open scale DAs and argue that even if the majority of these verbs follow Kennedy and Levin (2008), i.e., being interpreted as atelic, it is not the only possibility for them. DAs from this class appear usually with the atelic or ambiguous prefixes with locative denotation. Further in (53), follow the examples of the DAs based on the open scale adjectives: (53a) is telic, (53b-d) are atelic.

(53) a. *Táta nechá vy-hloubit jámu pro bázen kvůli*
dad lets out-deepen hole for swimming-pool because-of
dětem.
kids
'Dad will have a hole dug out for the pool because of the kids.'

b. *Já se jen snažím z-výšit obrat.*
I REFL only try from-heighten sales
'I am only trying to increase the sales.'

c. *Pouhá existence byla nesnesitelným utrpením, které musí*
mere existence was unberable suffering that must
rychle u-krátit.
quickly at-shorten
'The mere existence was an unbearable suffering that he must quickly shorten'

d. *Zaváhala jsem s rukou na klice dveří ve snaze*
hesitated am with hand on handle door in effort
pro-dloužit ten okamžik.
through-lengthen that moment
'With a hand on the door handle, I hesitated, trying to lengthen the moment.'

For the following class which is the DAs based on the upper-closed adjectives, Dočekal and Vlášková (2020) claim that the approach by Kennedy and Levin (2008) mostly get right, i.e., these DAs are usually interpreted as telic, however, the examples of atelic verbs can be also found. DAs from this class mostly occur with the bounded source/goal prefixes but can be also found with ambiguous ones. Consider the examples in (54), where the verb in (54d) can be interpreted as atelic, the others are telic.

(54) a. *Uklidila a vy-rovnala mé přikrývky.*
tidied-up and out-straightened my covers
'She tidied up and straightened my covers.'

b. *Nakonec se Erik navzdory všem předpovědím a diagnózám*
finally refl Erik despite all predictions and diagnoses
u-zdravil.
at-healed
'Finally, Erik has healed despite all predictions and diagnoses.'

c. *Říkal, že do večera by to mohlo do-schnout a zejtra*
said that to evening would it could to-dry and tomorrow
už má pršet...
already should rain
'He said it could dry up till the evening and tomorrow it should already rain...'

d. *...kořeny se o-zdraví a květiny lépe porostou.*
roots refl around-heal and flowers better grow
'...the roots will be healthier and the flowers will grow better.'

According to Kennedy and Levin (2008), the class of DAs derived from the lower-closed adjectives should be interpreted as atelic, since they inherit and posses only the initial point. From the examples in (55) follow that it starts to be less accurate when it concerns Czech DAs. In (55a-b), there are telic DAs, while in (55c-d) atelic. Moreover, Dočekal and Vlášková (2020) found much more telic DAs from this class than atelic in the corpus. If DAs from two classes above more or less stick to the approach by Kennedy and Levin, the rest two DA classes start to deviate from it.

(55) a. *V noci byl mráz, ale teď vzduch pro-vlhl.*
in night was frost but now air through-wet
'It was freezing in the night, but now air got wet.'

b. *Čidla a radary se za-špiní a může nastat problém.*
sensors and radars REFL past-dry and can come problem
'The sensors and radars will get dirty and a problem can arise.'

c. *Papír je pomačkaný, jako by na-vlhl, text je rozmazaný.*
paper is crumpled as would on-wet test is smudged
'The paper is crumpled, as if it got wet, the text is smudged.'

d. *Když si vzpomněla, kde je a kdo je, z-kalila její spokojenost vina.*
when REFL remembered where is and who is from-muddied her satisfaction guilt
'When she remembered where she is and who she is, the guilt spoiled her satisfaction.'

For the remaining class, DAs based on the totally closed adjectives, Kennedy and Levin predict the same behaviour as for DAs derived from upper-closed adjectives: verbs from these two classes inherit the initial and end points, hence should be interpreted as telic by default. As it was pointed above, Czech DAs from the upper-closed class tend to follow it, however, Dočekal and Vlášková (2020) report that only half of Czech verbs derived from the totally closed adjectives are telic. Consider the examples in (56), where (56a-b) are telic, while (56c-d).

(56) a. *Dolil, pak si znovu nalil a pomalu šálek vy-prázdnil.*
drank-up then REFL again poured and slowly cup from-emptied
'He drank up, poured himself another cup and slowly emptied it.'

b. *Rychle u-prázdnil v albu dvě místa na přední stránce.*
quickly at-emptied in album two spots on front page
'He quickly empties two spots on the front page of the album.'

c. *I snaha při-plnit stranickou kasu je mu spíše sympatická.*
also effort toward-fill party cash-box is him rather sympathetic
'He has sympathies also for the effort to fill the party cash box.'

d. *...a ještě by mohl ekologicky při-plinit nádrž.*
and even would could eco-friendly toward-fill tank
'...and he could even fill the tank eco-friendly.'

Lehečková (2011) notes the same variation and runs two experiments where she tests whether the scales affect telicity of Czech DAs. In the first experiment, the DAs based on the absolute adjectives with the prefix *vy-* were combined together with the adverbs *úplně* 'completely' and *trochu* 'slightly'. She assumes that if gradable adjectives are sensitive to this type of degree modifiers, then DAs might behave in the same way. She used both perfect and imperfect forms and divided the verbs into inchoative and causative.

The results of the first experiment show that the perfect DAs together with *úplně* 'completely' and *trochu* 'slightly' are much acceptable than the imperfect. So, Lehečková concludes that perfectivity affects the acceptability with the adverbs much more than the base scales.

In the second experiment, Lehečková uses DAs based on the lower-closed and totally closed adjectives. The items were constructed in a way that in the first part of the sentences there was a combination of *úplně* 'completely' and the DAs, while in the second there was a com-

parative form of the antonym adjectives. However, the results of the experiment were not statistically significant, thus the null hypothesis was not denied.

In the next chapter, I will also introduce the experiment which was constructed for the present work. The goal of the experiment was to test what affects telicity more – the core adjectival scale or prefixes. I used the absolute/relative adjectival distinction and the perfect DAs with the different prefixes. The results of it are worth to look at as they definitely bring new data to the varied telicity puzzle.

Conclusion In this chapter, I aimed to describe Slavic DAs. In order to do it, some morphological preliminaries were needed. Section 3.1 *Morphology and aspect* was divided into two subsections, where I discussed Slavic prefixes and affixes. For the prefixes, it was argued that first, they can be divided into lexical and superlexical, and second, that they are close to prepositions which might shed some light onto the DAs varied telicity puzzle. For the suffixes, it was outlined how they can affect verbal aspect. Of course, the overviews were not full but the essentials were stated.

In the second part of the chapter, I finally approached Slavic DAs. On the material of the useful sources and the previous chapters, I described the known facts for this verbal class. It was mentioned how Slavic DAs differ from English: morphology, prefixation in this case, plays a significant role and might probably outrun the core adjectival scales in terms of the meaning formation. I provided the examples from Dočekal and Vlášková (2020) where they find both telic and atelic interpretations for all four DA classes. It deviates from Kennedy and Levin (2008) and brings some new issues to the approach.

The chapter was ended by the brief summary of two experiments conducted by Lehečková (2011): the result of the first one showed that perfectivity affects the acceptability of DAs with the degree adverbs more than the scales of their core adjectives; the results of the second were not statistically significant. And now the content of the present work continues to the next chapter where the experiment, which was constructed in order to test if the prefixes in Russian actually affect telicity of DAs, will be described.

4 The experiment

In this chapter, I will present the experiment that was conducted to check if the prefixes affect telicicty of DAs in Russian. I will start with the report about the participants, then will move to the method. In section *Method*, I will present the structure of the experiment with the examples of both items and fillers. Then will follow the sections *Results* and *Discussion*.

In order to start analysing the data, it is necessary to establish the hypothesises first. The null hypothesis is the following: telicity of the prefixes do not affect telicity of DAs in Russian. If it is true, the DAs should behave the same and show no difference. The alternative hypothesis is that the prefixes along with the scales affect telicity of Russian DAs or even outrun them.

It is expected that the DAs with the telic prefixes will be generally better accepted than the DAs with the atelic. In the experiment, I used the relative/absolute adjectival distinction. A platform for linguistics experiments L-Rex by Starschenko and Wierzba (2021) was chosen. I used the similar scheme as Brasoveanu and Rett (2018) did for their experiments.

4.1 Participants

A link of the experiment was published and distributed primary via vk.com. It was explicitly mentioned that I was looking for native Russian speakers. All the respondents took part voluntarily and were not paid. The experiment was started 253 times but only 165 trials were completed, so 65% of trials were finished and 35% abandoned. The average time passing was 6 minutes and 40 seconds.

The experiment was not fully anonymous, I inquired about the participants' age and location, at the beginning they were asked if they were willing to provide such information and proceed. The oldest participant was 71 years old, the youngest was 15, the average age was 28,8. According to the locations data, people were mostly based in the different parts of Russia, but also in Kazakhstan, Belarus, Ukraine, the Czech Republic, Poland, Germany and Israel.

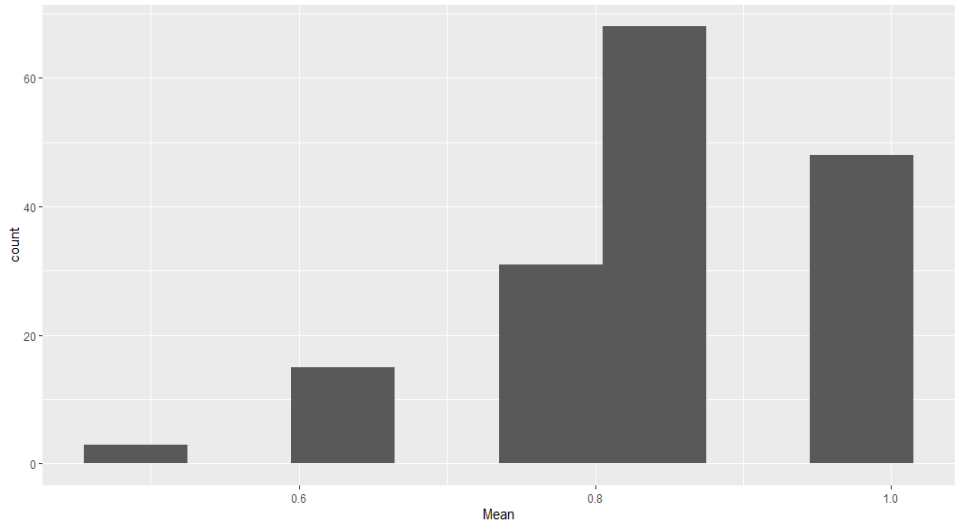

Figure 4.1: The histogram of reliability

In order to check if the participants payed attention to the questions, followed the instructions and did not choose the answers randomly, the so-called fillers were introduced. They were created in the same manner as the main items and were either good or bad. The examples of two fillers will be introduced in the further section. According to a histogram in Figure 4.1, out of 165 people only 3 were eliminated as their reliability was below 60%.

For the analysis described further below data of 162 participants were used.

4.2 Method

The experiment was composed of eight items and eight fillers. Before the main part, there were four training sentences which served as the examples and explained how to complete the experiment. Since it was a truth value judgment task, the participants were asked to asses the sentences on a Likert scale from 1 to 5, where 1 is *absolutely unacceptable* and 5 is *completely acceptable*. The items were arranged in a Latin square design, each participant saw only one condition of two possible.

The items and fillers were created in the same way and divided into two parts: the first was a context where detective Smith reported some

information to a colleague detective Johnson, then in the second part detective Johnson deduced something from the first part. In the items, the DAs were placed in the first part, in the second, there were the corresponding adjectives. The participants had to evaluate if Johnson's inferences were acceptable in the given context or not.

Further follow the description of the introduction, fillers and items of the experiment.

4.2.1 Introduction and test part

When the participants clicked the link, an introductory page appeared. They saw the following text, my contact email and a consent form.

> *Дорогие друзья,*
> *в этом лингвистическом эксперименте я тестирую адекватность некоторых предложений на русском языке в определённых контекстах. От вас не требуются глубокие познания орфографии или пунктуации, полагайтесь только на свою интуицию носителя языка.*
> *На экране вы увидите предложения, которые нужно оценить в данном контексте от 1 до 5, критерии оценки будут показаны далее в тренировочной части. Ни одно из предложений не несёт ироничный или саркастический характер.*
> *Далее, пожалуйста, укажите свой возраст и местоположение для демографического анализа. В остальном эксперимент полностью анонимный, его результаты будут использованы для моей дипломной работы. Тестирование начнётся с пояснительной части, после четырёх тренировочных предложений начнётся сам эксперимент.*
> *Спасибо!*

Translated as following:

> *Dear friends,*
> *in this linguistic experiment, I test acceptability of some sentences in Russian in the certain contexts. You are not required to have deep knowledge of spelling or punctuation, rely only*

on your native speaker's intuition.
On the screen, you will see the sentences that need to be evaluated in the given context from 1 to 5, the criteria of evaluation will be shown later in the training part. None of the sentences are ironic or sarcastic.
Next, please enter your age and location for a demographic analysis. Otherwise, the experiment is completely anonymous, the results will be used for my thesis. Testing will begin with the explanatory part, after four training sentences, the experiment itself will start.
Thank you!

If the consent was provided, the experiment continued with the following explanatory text.

Все вопросы составлены так, что детектив Смит сообщает какую-то информацию своему коллеге детективу Джонсону, который потом делает вывод из полученной информации. Вам необходимо оценить предоставленное предложение-вывод под чёрной точкой по шкале от 1 до 5, выбрать одну наиболее подходящую оценку, то есть решить, если предложение по контексту:
1 - абсолютно не подходит,
2 - частично не подходит,
3 - трудно сказать, подходит или не подходит,
4 - частично подходит,
5 - полностью подходит
Представьте, что предложения с чёрной точкой придумал иностранец, который довольно неплохо владеет русским языком, но он не уверен, если может носитель русского языка в данном контексте использовать его.
Далее, пожалуйста, укажите возраст и местоположение, после начнётся сам эксперимент. Удачи!

Translated as following:

All questions are constructed in such a way that Detective Smith gives some information to a colleague Detective Johnson,

who then infers something from received information. You need to evaluate the output sentence with a black dot on a scale from 1 to 5, choose the one most appropriate rating, i.e., decide if the sentence is in context:
1 - absolutely unacceptable,
2 - partially unacceptable,
3 - it is difficult to say whether it is acceptable or not,
4 - partially acceptable,
5 - completely acceptable
You can imagine, that the sentences with the black dot are made up by a foreigner who speaks Russian fluently, but not sure if a native Russian speaker can use the sentence in this context. Next, please enter your age and location, and then the experiment will begin. Good luck!

At the next page, the participants had to enter their age and location, after it the training part started. There were four test sentences, I will present two of them. They were constructed just like the items and fillers but with instructions below.

The first training sentence:

Детектив Смит сообщил своему коллеге детективу Джонсону, что потерпевший дописал роман.

• Детектив Джонсон решил, что роман был закончен.

Так как потерпевший "дописал"роман, то можно сделать вывод, что он закончен, поэтому это предложение в данном контексте требуется оценить как подходящее, то есть 4 или 5.

Translated as following:

Detective Smith told his colleague Detective Johnson that the victim had finished writing a novel.

• Detective Johnson decided that the novel was ready.

Since the victim "had finished" the novel, it can be concluded

that it is ready, so this sentence in this context must be evaluated as acceptable, i.e., 4 or 5.

The second training sentence:

Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитый прямо перед смертью варил суп.

• Детектив Джонсон решил, что в момент преступления суп был готов.

Так как убитый лишь "варил"суп, невозможно сделать вывод, что суп готов, поэтому в данном контексте это предложение требуется оценить как неподходящее, то есть 1 или 2.

Translated as following:

Detective Smith, from the crime scene, told his colleague Detective Johnson that the victim had been cooking a soup just before he died.

• Detective Johnson decided that the soup was ready at the time of the crime.

Since the victim "had been cooking" the soup, it is impossible to conclude that the soup was ready, so in this context, this sentence must be evaluated as unacceptable, i.e., 1 or 2.

4.2.2 Items

There were two sets of items: the DAs based on four relative and four absolute adjectives. Each DA from two sets had a telic and atelic prefix, so there were two conditions. All verbs were also perfect. Hence, there were four types of items:

- DAs derived from absolute adjectives
  - with telic prefixes

  - with atelic prefixes

- DAs derived from relative adjectives
  - with telic prefixes
  - with atelic prefixes

Further follow two examples of the items.

(57) a. *Detektiv Smit s mesta prestuplenija soobshchil svojemu*
Detective Smith from scene-GEN crime-GEN report-PST his-DAT
kollege detektivu Džonsonu, čto rubaška na
colleague-DAT detective-DAT Johnson-DAT that shirt on
sušilke {***vy-soxla***, ***pod-soxla***}.
drying-rack-PREP out-dry-PST, under-dry-PST.
'Detective Smith reported to his colleague detective Johnson from a crime scene that a shirt dried on a drying rack.'

b. *Detektiv Džonson rešil, čto rubaška byla suxaja.*
Detective Johnson conclude-PST that shirt be-PST dry.
'Detective Johnson concluded that the shirt was dry.'

(58) a. *Detektiv Smit s mesta prestuplenija soobshchil svojemu*
Detective Smith from scene-GEN crime-GEN report-PST his-DAT
kollege detektivu Džonsonu, čto ubityj prjamo
colleague-DAT detective-DAT Johnson-DAT that murdered just
pered smertju {***razo-grel***, ***po-grel***} *jedu.*
before death from-warm-PST, on-warm-PST food
'Detective Smith reported to his colleague detective Johnson from a crime scene that a murdered man warmed food right before his death.'

b. *Detektiv Džonson rešil, čto jeda v moment*
Detective Johnson conclude-PST that food in moment
prestuplenija byla gorjačaja.
crime be-PST.F hot-F.
'Detective Johnson concluded that food was warmed at the time of the crime.'

The item in (57) is from the absolute set, (58) is from the relative. The DAs were always placed in the first item sentence, in (57-58a) they are marked bold, the first verbs have the telic prefixes *vy-* and *razo-*, the second the atelic *pod-* and *po-*. In the second item sentences, (57-58b), i.e., the Johnson's inferences, there were the corresponding adjectives, in these cases *suxoj* 'dry' and *gorjačij* 'hot'. The positive test was chosen as it seemed to be the most convenient.

In Table 4.1 there are the lists of all adjectives and DAs that were used in the experiment. The full item sentences are attached in Appendix *Items*.

Table 4.1: The lists of the adjectives and DAs used in the experiment

adjective	telic DA	atelic DA
relative		
gorjačij 'hot'	*razo-greť*	*po-greť*
nizkij 'low'	*s-nizitsja*	*po-nizitsja*
bednyj 'poor'	*o-bedneť*	*po-bedneť*
korotkij 'short'	*u-korotiť*	*pod-korotiť*
absolute		
suxoj 'dry'	*vy-soxnuť*	*pod-soxnuť*
polnyj 'full'	*na-polniť*	*po-polniť*
mokryj 'wet'	*vy-močiť*	*po-močiť*
čistyj 'clean'	*vy-čistiť*	*po-čistiť*

4.2.3 Fillers

As was mentioned above, the filler sentences served as verification of the participants reliability. The fillers were constructed in the same manner as the items and mixed together with them. There were two sets of fillers – good and bad. The good fillers were well-formed and had to be assessed as 4 or 5 on the Likert scale, while the bad ones were ungrammatical and had to be assessed as 1 or 2. Further follow two examples of the fillers.

(59) a. *Detektiv Smit s mesta prestuplenija soobshchil svojemu*
Detective Smith from scene-GEN crime-GEN report-PST his-DAT
kollege detektivu Džonsonu, čto ubityj na
colleague-DAT detective-DAT Johnson-DAT that murdered on
svojem učastke postroil dom.
his land-plot buildPST house
'Detective Smith reported to his colleague detective Johnson from a crime scene that a murdered man had built a house on his land plot.'

b. *Detektiv Džonson rešil, čto dom byl dostrojen.*
Detective Johnson conclude-PST that house be-PST built.
'Detective Johnson concluded that the house was finished.'

(60) a. *Detektiv Smit s mesta prestuplenija soobshchil svojemu*
Detective Smith from scene-GEN crime-GEN report-PST his-DAT
kollege detektivu Džonsonu, čto ubitaja prjamo
colleague-DAT detective-DAT Johnson-DAT that murdered just
pered smertju čitala knigu.
before death readPST-F book
'Detective Smith reported to his colleague detective Johnson from a crime scene that a murdered woman had been reading a book right before her death.'

b. *Detektiv Džonson rešil, čto kniga byla pročitana*
Detective Johnson conclude-PST that book be-PST read
ubitoj.
murdered-INSTR.
'Detective Johnson concluded that the book was read by the murdered woman.'

The filler in (59) is considered to be good, (60) is bad. The filler is good if it is possible to conclude that the first part entails the second. I used perfect/imperfect distinction for them: the verbs in the good fillers were perfect and it was possible to conclude that the Johnson's inferences were acceptable, while the verbs in the bad fillers were

imperfect and the inferences were not acceptable. The full list of the fillers is attached in Appendix *Fillers*.

4.3 Results

In this section, I will present the results of the experiment. The whole statistic analysis was carried in RStudio by R Core Team (2020). In addition, I use Levshina (2015) as a source of the descriptive statistics terminology.

In Table 4.2, there are presented the measures of central tendency for the items, the means and medians. They show how the participants assessed the items on the Likert scale in general. The mean, or average, is the most popular measure of the central tendency. However, the means can be easily affected by the outliers, therefore, sometimes it is useful to look at the medians as well. The medians are the middle values of the ordered values, because of it they might give a better idea of the typical value. In this case, the means and medias were not far from each other.

Table 4.2: The measures of central tendency

item	mean	median
absolute + atelic	3.009259	3
absolute + telic	3.962963	4
relative + atelic	2.799383	3
relative + telic	2.901235	3

In Figure 4.2, there is a box plot graph which is a visualisation of the measures of central tendency. On the x axis, there are four tested conditions, on the y is the Likert scale. The thick lines in the boxes correspond to the medians, the dots are the means. The lower and upper boundaries of the boxes are called hinges and they represent the first and the third quartiles. Since the median is the middle value, it is the second quartile, so below it the first half of the data lies, above the second. The first quartile is the point which separates a first quarter of observations, i.e., 25% from the remaining 75%, while the third quartile does the opposite: it separates 75% of observations from the remaining

quarter. The lines outside the boxes are the so-called whiskers and they represent the minimum and maximum values which were observed.

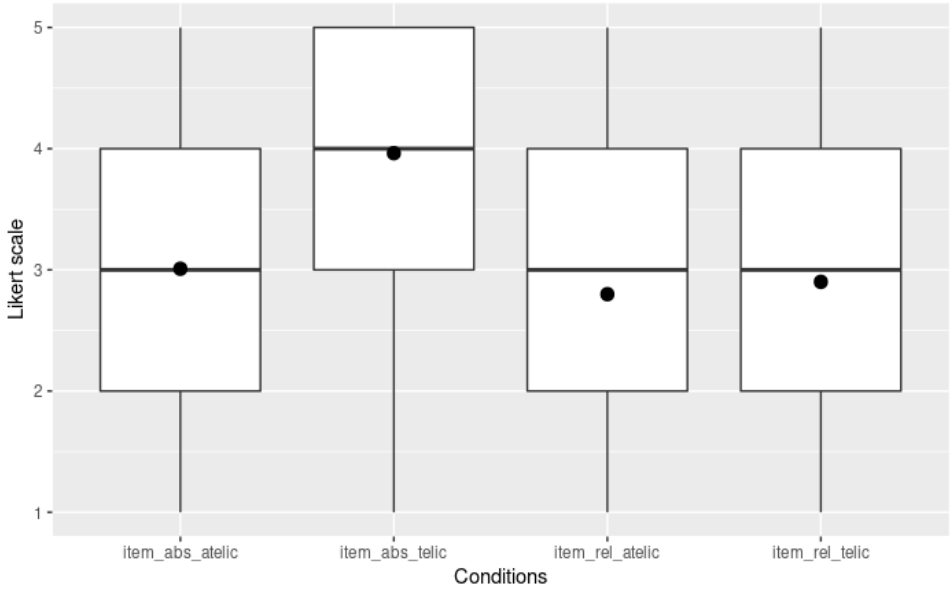

Figure 4.2: The box plot graph

From the graph it is possible to conclude that the scores for all DA classes are distributed symmetrically around the median. Nevertheless, the results for two class are different. For the items with the DAs based on the absolute adjectives with the atelic prefixes and all items with the DAs derived from the relative adjectives (the first, third and forth boxes respectfully), the median is 3. There were people who rated them as absolutely acceptable or unacceptable, but for the most it was difficult to say whether these items were acceptable or not in the given context. However, the means show that both conditions with the DAs based on the relative adjectives were slightly worse, their means are `2.799383` for atelic and `2.901235` for telic.

When it comes to the DAs based on the absolute adjectives with the telic prefix on (the second box), the median, which is the second quartile, is 4, so the half of the participants rates these items as 4 or 5. There were people who evaluated the items as 2 or 1, according to the whiskers, but they are below the first quartile. This condition is the most acceptable of all four.

The next graph in Figure 4.3 shows how each DA was evaluated. On the *x* axis, there is every DA used in the experiment, the Likert scale is on the *y* axis. The green boxes represent the DAs based on the absolute adjectives, the blue boxes are the DAs derived from the relative adjectives. In addition, each box has either the orange or red frame, whiskers and dots in order to distinguish the prefix type, telic and atelic respectfully. The graph is supported by Table 4.3.

All pairs, except the DAs from *short*, fall under an obvious pattern: the boxes with the orange frame, i.e., the telic DAs, are better accepted than the atelic DAs. Also interesting how high both DAs derived from *gorjačij* 'hot' climbed up[1]. Only they have the medians higher than 3 from the relative 'blue' class.

The most acceptable was the telic *vy-soxnuť* derived from *suxoj* 'dry', its median is 5. The least acceptable, according to the means, is the atelic *po-nizitsja* based on *nizkij* 'low' with `2.1`, however, there are the outliers, so a few participants evaluated it as acceptable.

Table 4.3: The measures of central tendency for each DA

absolute			relative		
item	mean	median	item	mean	median
`clean_atelic`	`3.542857`	4	`low_atelic`	`2.100000`	2
`clean_telic`	`3.923913`	4	`low_telic`	`2.336957`	2
`dry_atelic`	`2.304348`	2	`poor_atelic`	`2.706522`	3
`dry_telic`	`4.457143`	5	`poor_telic`	`3.257143`	3
`full_atelic`	`2.614286`	3	`short_atelic`	`2.457143`	2
`full_telic`	`3.521739`	4	`short_telic`	`2.369565`	2
`wet_atelic`	`3.608696`	4	`warm_atelic`	`3.684783`	4
`wet_telic`	`4.100000`	4	`warm_telic`	`3.985714`	4

1. In Figure 4.3 and Table 4.3, they are marked as `warm_atelic` and `warm_telic`.

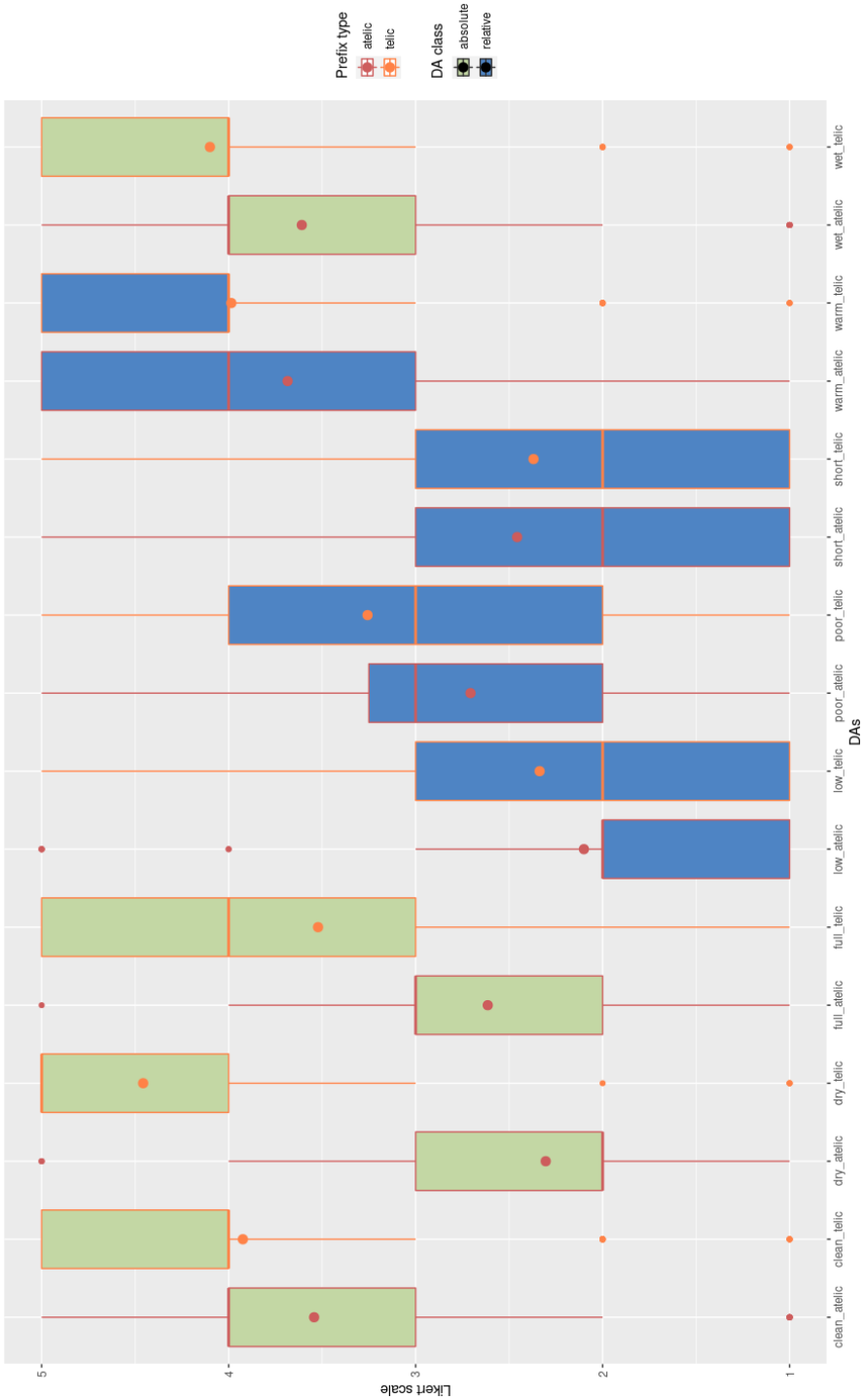

Figure 4.3: The box plot graph for each DA

The graph in Figure 4.4 is the standard error bar graph. It shows that if the experiment was repeated again and again but the different participants completed it, it would be 95% probability that the possible means would be somewhere in between these intervals. This graph indicates an estimated error: a shorter error bar shows that the values are concentrated, hence, the results are more reliable, while a long error bar signalling that the data more spread and less reliable. In this case, the error bars are short, therefore, the results are reliable.

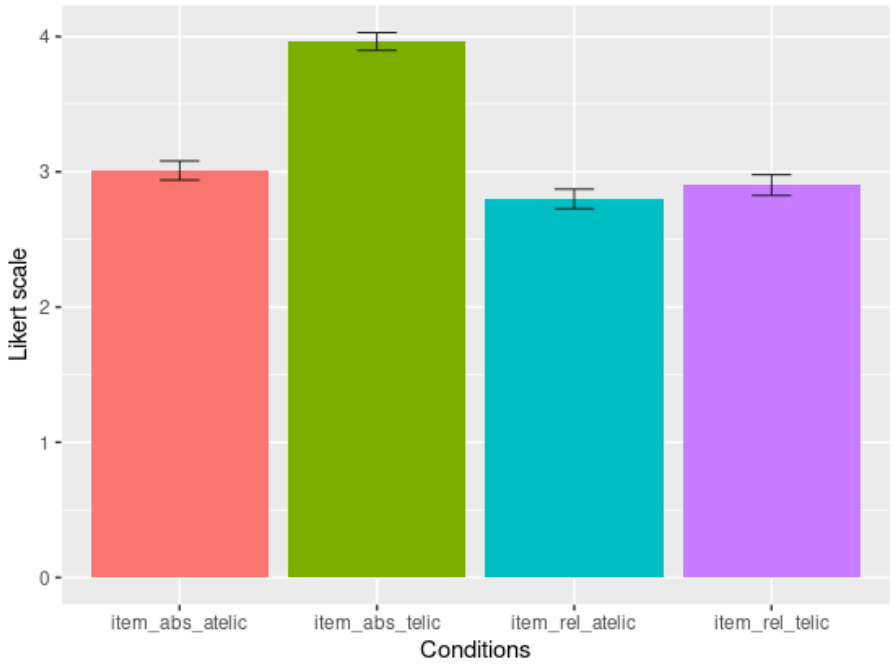

Figure 4.4: The standard error bar graph

In order to check what affected the acceptability more, a following mixed model was constructed. The linear models usually make the assumptions about the distribution of the data. Two values are in focus here – p-value and t-value. p-value is a conditional probability, it shows what is the probability that the null hypothesis is true, the lower it is, the higher is the probability that the results are statistically significant and do not fall under the null hypothesis. t-value is the result of t-test and it is needed for the same but it measures the probability a bit

differently: the further it is from zero in either direction, the more likely the null hypothesis is denied.

Two factors were used – the DA class and the prefixes. The strong positive effect was found of the telic prefix: t-value = `11.437`, p < `0.001`. Also a negative effect of the relative DA class was detected: t-value = `-2.318`, p < `0.05`. And a negative interaction of `DAClass relative` by `prefix telic` was found: t-value = `-6.652`, p < `0.001`. The results are in Figure 4.5

```
## Fixed effects:
##                                Estimate Std. Error         df t value Pr(>|t|)
## (Intercept)                     2.96587    0.21794    3.61537  13.609 0.000309
## DAClassrelative                -0.20988    0.09056 1127.99869  -2.318 0.020650
## prefixtelic                     1.04047    0.09097 1128.48443  11.437  < 2e-16
## DAClassrelative:prefixtelic    -0.85185    0.12807 1127.99869  -6.652 4.51e-11
```

Figure 4.5: The linear mixed model

A discussion of the results follows in the next section.

4.4 Discussion

In this section, I will discuss the results obtained from the experiment. At the first glance it seems, the null hypothesis was denied for the absolute DAs, however, not for the relative DA class. From the graph in Figure 4.2 and Table 4.2 follows that the most acceptable items were the absolute DAs with the telic prefixes. It was expected that the absolute DAs with the atelic prefixes should be less acceptable in the positive test. What was not expected that the relative DAs might behave in almost the same way despite the prefixes. Even there is a slight difference in the means, the relative DAs with the atelic prefixes are indeed less acceptable, it seems that for the participants it was hard to decide whether these DAs are acceptable or not.

Since the results of one item might affect the whole class, I decided to do the additional box plot graph for each DA, which is in Figure 4.3, and several interesting observations jumped out of it. Both DAs based on the relative adjective *gorjačij* 'hot' were rated higher than all other relative DAs which are mostly lying under 3. It does not quite match Kennedy and Levin (2008) as they do not predict the

telic interpretation for the open scale adjectives: even with the atelic prefix *po-*, it is better accepted than some absolute DAs with the atelic prefixes, i.e., *po-čistiť* from *clean* and *po-močiť* from *wet*.

However, following them, one might assume that *hot* and *cool* could behave the same since they belong to the temperature dimension, so there might be involved the purely conventionalized meaning for 'being hot' just like the room temperature for 'being cool'. Personally, I can imagine one scenario where an object is so hot that it is not possible to touch or hold it, but it might vary for each person and it is not the only case of 'being hot'.

Another question arises from the graph in Figure 4.3: it seems that all pairs follow the general pattern where the telic is more acceptable in the positive test, except the *short* DAs. It is not clear why they behave in such a way, probably the prefix *u-*, the most frequent prefix for DAs in Russian which was on the telic counterpart, is not telic enough. It might be tested in the next experiments.

It seems that there is a difference between the absolute and relative DA classes, but because the strong positive effect was found for the telic prefix (Figure 4.5), it is possible to conclude that the telic prefixes can change the interpretations of both DA classes, however, for the absolute class the effect is much stronger.

When it comes to the negative effect which was detected for the relative DA class, it is true that it shows a reversed directionality, but it does not affect the significance. The same applies to the negative interaction of the relative DA class by the telic prefixes. So, it might be concluded that the null hypothesis was denied.

The experiment was a step towards the description of DAs. The results show that the overall picture is not that simple. Each box has either the whiskers or outliers, so the participants were not completely sure about the acceptability of the DAs. In Slavic, verbal morphology plays a very important role and it definitely must be taken into account. Nevertheless, the topic is very interesting and more experiments need to be carried out.

Conclusion In this chapter, I presented the experiment that was constructed in order to check whether the prefixes and their telicity somehow affect telicity of Russian DAs. In the fist part, I described the structure and methodology, in the second part, I turned to the results and analysis.

At the first sight, it seemed that only the absolute DA class showed the difference, but then it was found in the linear mixed model that the telic prefixes affect both classes. Also the unusual behaviour of the prefix *po-* was detected: it was accepted better with the relative adjective *gorjačij* than it was expected.

5 Summary

In this chapter, I will summarize the present work. The goal was to explore the class of verbs known as DAs and bring new data to the discourse. One of the intriguing puzzles of DAs is their varied telicity. They can be interpreted differently: the first intuition about them it 'become *x*', e.g., *to dry*, but an additional interpretation might be found among them and it is 'become *x*-er', e.g, *to shorten*.

DAs are deadjectival verbs, so the properties of these two word classes might meet in them, therefore, in the first chapter, I discussed adjectives and verbs separately. In the first part devoted to adjectives, I introduced the scalar approach with four possible scales: totally open, totally closed, upper-closed and lower-closed. It was claimed that the adjectives from these classes behave differently with regard to their scales. This distinction is used by Kennedy and Levin (2008) where they assume that it might resolve the telicity puzzle.

However, DAs are not adjectives but verbs, for this reason, I decided that it was important to look at the verb class and namely at verbal aspect. I presented the theories by Vendler (1957) and Smith (1997). Vendler detects activity, accomplishment, achievement, and state terms, Smiths adds semelfactives to them. All of them have different properties and describe events if they are dynamic or static, telic or atelic, durative or instantaneous. The term DEGREE ACHIEVEMENTS, which was suggested by Dowty (1979), indicates that these verbs are achievements but they also can be accomplishments, activities or even statives.

In the second chapter, I introduced three approaches aiming to resolve the varied telicity puzzle. The first one was established in Dowty (1979) and then expanded by Abusch (1985). They argue that since the core adjectives of DAs are ambiguous, that is why DAs show the aspectual inconsistency. The second approach by Hay et al. (1999) criticizes the first and suggests a different solution. They claim that DAs inherit scale structures of their core adjectives which might be either closed or open, and it affects telicity.

Nevertheless, it has its own flaws, that is why Kennedy and Levin (2008) elaborate it. They argue that DAs encode measure functions which associate objects with ordered values on the scales. The scales

again are provided by the core adjectives. Thus, the DAs from the totally open and lower-closed scales adjectives are atelic by default because they do not posses the end point, whilst the totally closed and upper-closed scales adjective do and that is why they might be interpreted in the telic sense.

The second chapter is ended by the summary of Kawahara (2017) where he claims that Japanese DAs do not behave as predicted by Kennedy and Levin (2008). Japanese DAs seem to be telic even if they are derived from the open scale adjectives. Kawahara supposes that there is a fixed standard on their scales, that is why Japanese DAs are telic by default.

Slavic DAs do not quite fit the approach by Kennedy and Levin either and it was the topic of the third chapter. In the first part, I provided some morphological necessities, i.e., how prefixes and suffixes contribute to verbal aspect in Slavic. I admit that the overviews might seem oversimplified, however, the goal was not to describe them in every possible detail but to deliver the preliminaries for the DAs analysis.

In the second part of the third chapter, I finally focused on Slavic DAs themselves. Some known observations regarding their structure and meaning were provided, then I introduced the examples from Dočekal and Vlášková (2020) of all four DA classes both in the telic and atelic interpretations. They report that the DAs based on the open and upper-closed scales adjectives in general behave like predict Kennedy and Levin (2008), but the remaining two classes, DAs from the totally closed and lower-closed scales adjectives, start to depart from the outlined scheme. Dočekal and Vlášková assume that the prefixes might interfere to the varied telicity of Slavic DAs more than the given adjectival scales.

In order to test it, the experiment was conducted for Russian. The structure of it and the results were presented in the forth chapter. There were four sets of the DAs: based on the relative and absolute adjectives either with the telic or atelic prefixes. It was expected that the verbs with the telic prefixes will be generally better accepted in the positive test than the verb with the atelic ones despite the scale. According to the results, the strong positive effect was found of the telic prefixes for both classes, however, it is much stronger for the absolute class than the relative. Hence, at the end it is concluded that

telicity of Russian DAs may be affected not only by their adjectival scales, but also by the prefixes.

There are several curious questions remained open for the further researches, a list of them follows.

1. Why do the relative and absolute DAs exhibit different sensitivity to the prefixes?

2. It was articulated that some Slavic DAs allow several different prefixes, whilst others do not. Is due to their adjectival origin, some limitations of the prefixes or anything else?

3. Why some DAs are perfectly fine without any prefix on, while the others require it to be felicitous?

4. Is there a particular reason why some adjectives allow to derive DAs but the others do not?

5. Do the Czech prefix *z(e)*- and its Russian counterpart *u*-, which seem to be the most productive prefixes for DAs, bear some special properties?

6. It would be interesting to examine how the exceed prefixes, e.g., Russian *pere*-, and the opposite *nedo*- interact with the different DA classes, if they are suitable for each and every verb or there are some limitations.

7. If there is any specific interaction between the other lexical prefixes and DAs, e.g., *pro-močit'* 'through-wet'.

It is clear that the discussion about DAs combines together several different topics as adjectives and scales, verbs and aspect, morphology, prefixation, and thus adds the new issues, but it might also provide the needful solutions to some already existing inconsistencies. The present work contributed just a little to the discourse and some questions were left open, however, it brought the fresh data. The varied telicity of DAs is still a tempting puzzle and the thorough examinations should continue.

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Appendices

A Items and fillers

A.1 Items

A.1.1 Relative

1 (atelic): Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитый прямо перед смертью погрел еду.

- Детектив Джонсон решил, что еда в момент преступления была горячая.

1 (telic): Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитый прямо перед смертью разогрел еду.

- Детектив Джонсон решил, что еда в момент преступления была горячая.

2 (atelic): Детектив Смит сообщил своему коллеге детективу Джонсону, что уровень преступности в Южном районе понизился.

- Детектив Джонсон решил, что теперь уровень преступности в этом районе низкий.

2 (telic): Детектив Смит сообщил своему коллеге детективу Джонсону, что уровень преступности в Южном районе снизился.

- Детектив Джонсон решил, что теперь уровень преступности в этом районе низкий.

3 (atelic): Детектив Смит сообщил своему коллеге детективу Джонсону, что население Северного района победнело.

- Детектив Джонсон решил, что теперь население в этом районе бедное.

3 (telic): Детектив Смит сообщил своему коллеге детективу Джонсону, что население Северного района обеднело.

- Детектив Джонсон решил, что теперь население в этом районе бедное.

4 (atelic): Детектив Смит сообщил своему коллеге детективу Джонсону, что жертва подкоротила волосы после инцидента.

- Детектив Джонсон решил, что волосы жертвы были короткие.

4 (telic): Детектив Смит сообщил своему коллеге детективу Джонсону, что жертва укоротила волосы после инцидента.

- Детектив Джонсон решил, что волосы жертвы были короткие.

A.1.2 Absolute

1 (atelic): Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что рубашка на сушилке подсохла.

- Детектив Джонсон решил, что рубашка была сухая.

1 (telic): Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что рубашка на сушилке высохла.

- Детектив Джонсон решил, что рубашка была сухая.

2 (atelic): Детектив Смит сообщил своему коллеге детективу Джонсону, что подозреваемый во время допроса пополнил стакан водой.

- Детектив Джонсон решил, что стакан был полный.

2 (telic): Детектив Смит сообщил своему коллеге детективу Джонсону, что подозреваемый во время допроса наполнил стакан водой.

- Детектив Джонсон решил, что стакан был полный.

3 (atelic): Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что подозреваемый помочил футболку.

- Детектив Джонсон решил, что футболка была мокрая.

3 (telic): Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что подозреваемый вымочил футболку.

- Детектив Джонсон решил, что футболка была мокрая.

4 (atelic): Детектив Смит сообщил своему коллеге детективу Джонсону, что убийца почистил ковёр на месте преступления.

- Детектив Джонсон решил, что ковёр был чистый.

4 (telic): Детектив Смит сообщил своему коллеге детективу Джонсону, что убийца вычистил ковёр на месте преступления.

- Детектив Джонсон решил, что ковёр был чистый.

A.2 Fillers

A.2.1 Good

1. Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитый на своём участке построил дом.

    - Детектив Джонсон решил, что дом был достроен.

2. Детектив Смит сообщил своему коллеге детективу Джонсону, что подозреваемый во время допроса выпил воду из стакана.

    - Детектив Джонсон решил, что стакан был пустой.

3. Детектив Смит сообщил своему коллеге детективу Джонсону, что убитая прямо перед смертью сварила суп.

    - Детектив Джонсон решил, что суп в момент преступления был готов.

4. Детектив Смит сообщил своему коллеге детективу Джонсону, что кто-то доел пирог с тарелки.

    - Детектив Джонсон решил, что пирог был съеден.

A.2.2 Bad

1. Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитый прямо перед смертью пёк пирог.

    - Детектив Джонсон решил, что пирог в момент преступления был готов.

2. Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитая прямо перед смертью читала книгу.

- Детектив Джонсон решил, что книга была прочитана убитой.

3. Детектив Смит сообщил с места преступления своему коллеге детективу Джонсону, что убитый прямо перед смертью писал статью.

   - Детектив Джонсон решил, что статья в момент преступления была закончена.

4. Детектив Смит с места преступления сообщил своему коллеге детективу Джонсону, что убитая прямо перед смертью рисовала картину.

   - Детектив Джонсон решил, что картина в момент преступления была дорисована.