Scalarity Determines Argument Structure in English Particle Verbs and Slovak Prefixed Verbs

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Abstract: The theory of situation-type aspect based on scales (e.g. Tenny 1994; Jackendoff 1996; Rappaport Hovav 2008; Rappaport Hovav and Levin 2010) is applied in the present study to aspectual English verb particles and Slovak verbal prefixes. I argue that both particles and prefixes come in two types, non-scalar and scalar, depending on how they describe the change denoted in the verb root. Non-scalar particles and prefixes do not alter argument structure, e.g. *The children walked (on) in silence*. They appear in predicates without an underlying scale, which are consequently atelic. In contrast, scalar particles and prefixes appear in predicates with an underlying scale, which are potentially telic. Scalar prefixes and particles can alter argument structure because scales require an obligatory realization of the measured participant, e.g. *Ally slept *(off) a headache*. The study reviews manifestations of argument-structure alternations as well as factors that determine the effect of particles and prefixes on telicity.

Keywords: aspect, telicity, particle verbs, prefixed verbs, scalarity, argument structure

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1. Introduction

This paper proposes a unified account of the syntactic behaviour and semantics of aspectual particles and prefixes in two typologically distinct languages, namely particles in English, an analytical language, and prefixes in Slovak, an inflectional Slavic language.[1] This paper offers a new perspective to view known data rather than attempting to provide new data. I argue that both particles and prefixes come in two types, each with different semantic (aspectual) and syntactic (argument-structure) effects. These two types I term non-scalar and scalar, building on the scalar theory of aspect (e.g. Tenny 1994; Jackendoff 1996; Rappaport Hovav 2008; Rappaport Hovav and Levin 2010; among many others).

For Slavic, the existence of two types of prefixes – internal/lexical and external/superlexical prefixes – has been observed in Gehrke (2004), Milićević (2004), Svenonius (2004), and di Sciullo and Slabakova (2005), for instance. In this literature, the two types of prefixes are characterized as follows: external/superlexical prefixes, such as the one in (1a), originate outside a verb phrase (VP), with Aspect head above V. These prefixes have quantificational as well as aspectual meanings, marking temporal boundedness (perfectivity), but not telicity. In contrast, internal/lexical prefixes like (1b) originate inside a VP, with Result head below V. They cannot stack on top of other prefixes. This type of prefixes can cause argument-structure alternations and mark the aspectual notion of telicity. Besides aspectual meanings, they also have spatial and idiosyncratic meanings.[2]

(1) a. Ivan po-čital   (knigu).   (Russian)
    Ivan PREF-read (book)
   'Ivan read (a book) for a little while.'
  (from Babko-Malaya 2003, cited in Svenonius 2004:236)

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[1] The contribution of particles to the aspect of a predicate may depend on whether the particle has primarily a spatial or aspectual meaning (see, for instance, McIntyre 2004 who shows that the transitivity of certain particles depends on their spatial or aspectual use, and Giddings 2001 who shows that the particles *down* and *out* change the aspect of predicates unless the verb denotes a directed motion event). Therefore, in this paper, I focus on aspectual meanings only and do not address particles and prefixes in their directional uses (in motion events), e.g. *bring up* 'fetch upwards', *take in* 'take inside', *v-behnúť* in-run 'run into', *od-letieť* away-fly 'fly away', or non-compositional (idiomatic) uses, e.g. *put off* 'delay', *pass away* 'die', *u-tiecť* PREF-flow 'run away', *zá-vidieť* PREF-see 'envy' (see, for instance, Celce-Murcia and Larsen-Freeman (1999:432–433) and Jackendoff (2002) for English particles).

[2] List of abbreviations in the glosses: ACC – accusative, IPFV – imperfective, NOM – nominative, PFV – perfective, PREF – prefix, REFL – reflexive, SUFF – suffix.

   b. Ivan na-pisal   *(pisjmo).   (Russian)

     Ivan PREF-wrote   *(letter)

   'Ivan wrote a letter.'

 (from Babko-Malaya 1999, cited in Svenonius 2004:217)

  My account makes a parallel distinction, yet offers deeper insight into it by arguing that the necessary condition for telicity marking and argument alternation effects is underlying scalarity. Therefore, internal/lexical prefixes are scalar and external/superlexical prefixes are non-scalar. In addition, the present account discusses the dynamicity marking effect of prefixes on stative verbs. Competing accounts have been proposed by Součková (2004) for Czech, Filip (2008) for Slavic, and Kagan (2012) for Russian. I will discuss these accounts and point out the problems with them in Section 6.

  English aspectual particles have been standardly treated as marking telicity since Brinton (1985), for example, atelic *eat* and telic *eat up*. Not all aspectual particles, however, mark telicity. For example, the particles in *drive on/along* and *work away (at the problem)* mark continuative or iterative aspect. In a more recent account, Cappelle and Chauvin (2010) suggest that aspectual particles are either comparative (e.g. *(anger) build up*), or resultative, (e.g. *team up*). However, their account suffers from the same shortcoming as Brinton's (1985): it cannot be generalized over all aspectual particles, as the particles in *chatter on* or *sleep away*, for instance, are neither comparative nor resultative. I therefore propose that English aspectual particles also come in two types with different effects on telicity and argument structure.

  The rest of the paper is organized as follows. Section 2 introduces the scalar theory of aspect and lays out the proposal and its predictions. Sections 3 to 5 discuss relevant data, providing support for the predictions. Section 6 compares the proposed account to previous accounts. And the last section concludes the paper.

2. Scalar Theory of Aspect

There are two kinds of aspectual distinctions in language (Smith 1997): grammatical aspect or viewpoint aspect, on the one hand, and situation-type aspect or lexical aspect, also known as Aktionsart, on the other. Grammatical aspect involves the distinction between the perfective and the imperfective. While the perfective presents a situation[3] as a whole, including its endpoint, the imperfective presents only part of a situation,

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[3] I use the term 'situation' to cover both states and dynamic events.

not including its beginning or endpoint (Comrie 1976:4). Situation aspect, on the other hand, involves the distinctions between dynamicity and stativity (depending on whether a situation involves change or not, e.g. stative *know, believe* and dynamic *play, sing*), durativity and punctuality (depending on whether a situation has duration or not, e.g. durative *walk, play* and punctual *enter, die*), and atelicity and telicity (e.g. atelic *sing, walk* and telic *eat an apple, make a chair*). Telicity has been described as a goal (from Greek *telos*), an inherent endpoint "beyond which the process cannot continue" (Comrie 1976:45), a culmination point, or "a moment of temporal transition" (van Hout 1996:92). This paper discusses only particles and prefixes and their contribution to the situation aspect of predicates.

       To account for the aspectual contribution of English particles and Slavic prefixes, I build on a theory according to which scalarity underlies situation aspect (more or less explicit in Tenny 1994; Jackendoff 1996; Hay, Kennedy and Levin 1999; Smollett 2005; Beavers 2008; Filip 2008; Rappaport Hovav 2008; Rappaport Hovav and Levin 2010, for instance). Rappaport Hovav (2008), in particular, distinguishes two classes of dynamic verbs, depending on the kind of change they denote. Non-scalar verbs describe a change that is not ordered along a scale (e.g. *play, laugh* and *exercise*). Scalar verbs denote a change ordered along a scale, which is an ordered set of degrees along a particular dimension, such as temperature, cost, or depth. While non-scalar verbs typically express a manner, scalar ones typically express a result (Rappaport Hovav and Levin 2010). Scales can be open, as in *lengthen, slow* and *ascend*, or bounded, as in *flatten, enter* and *die*, which has to do with whether the verb denotes an inherent culmination endpoint serving as a bound on the scale or not.[4] Therefore, only bounded scales underlie telic predicates. Atelic predicates can denote either non-scalar change or change on an open scale.

       Furthermore, Rappaport Hovav (2008) distinguishes three types of scales depending on the attribute that undergoes the scalar change (see Table 1). Path scales are established by the theme's changing position along a path. They are lexicalized in (i.e. lexically expressed by) various phrase or sentence constituents, such as a directed motion verb (e.g. *ascend* or *enter*), a goal prepositional phrase (e.g. *walk to the store*), or a measure phrase (e.g. *walk a mile*). Property scales express a change in a property of the theme, such as brightness, temperature, or speed, and are typically lexicalized in change of state verbs (e.g. *brighten, warm, slow*). Finally, volume/extent scales are established by the volume or extent of the theme incrementally involved in the event, realized as the direct object (e.g. *build a house* or *eat a sandwich*).

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[4] Rappaport Hovav (2008) also distinguishes between multi-point scales and two-point scales, giving rise to the distinction between durative and punctual situations. Therefore, in such an account, punctual verbs like *die* are also understood as scalar.

Table 1. Types of scales (based on Rappaport Hovav 2008).

TYPE OF SCALE	ESTABLISHED BY	DENOTES	LEXICALIZED IN	EXAMPLES
PATH	change of theme's position along a path	directed motion	verb	*ascend*
			goal prepositional phrase	*run to the line*
			measure phrase	*run a mile*
PROPERTY	change in theme's property	change of state	verb	*freeze* *open*
VOLUME/EXTENT	theme's volume or extent	incremental theme	direct object	*eat an apple* *read a book*

It is important to stress that when the scale is lexicalized in a constituent other than the verb, the verb itself is non-scalar and it is the goal prepositional phrase, measure phrase, or the direct object that establishes a scale, e.g. *walk*, *run*, and *eat* (non-scalar) compared respectively to *walk to the beach*, *run a mile*, and *eat an apple* (scalar). This is connected to the "require[ment] that the participant whose property is measured by [scales] be overtly realized" (Rappaport Hovav 2008:24). As a consequence, scales can alter argument structure. For instance, intransitive *eat* or *read* are always non-scalar; in order to become scalar, they require a scalar direct object, as in *eat an apple* and *read a book*.

Another source of scalarity in English, besides the ones in Table 1, are complex predicates, such as resultative phrases (2) and particle verbs (3).

(2) a. John ran the soles of his shoes bare.

b. Mary wiped the table clean.

(3) a. John ran the soles of his shoes off.

b. Mary wiped down the table.

While scalarity in resultative phrases has received some attention (e.g. Wechsler 2005), the present paper attempts to be a first step towards discussing scalarity in particle verbs.

Taking the scalar theory of aspect as a framework, I propose that both English aspectual particles and Slovak aspectual prefixes describe the change denoted in the verb root as scalar or non-scalar and thus fall into two types (scalar particles/prefixes and non-scalar particles/prefixes). The advantages of this theory relevant for an

account of particles and prefixes are the following: first, it exhaustively covers the data, as it allows one to deal with both particles and prefixes that mark telicity as well as the ones that do not (see Section 1). The proposed account not only covers both types of particles and prefixes, but also offers an aspectual account for the existence of the two types of prefixes.

Second, the scalar theory of situation aspect offers an explanation of argument-structure alternations. According to Rappaport Hovav (2008:24), "scales require that the participant whose property is measured by them be overtly realized". It follows that a telic predicate, or scalar predicate in general, must express a measured participant (e.g. *eat* and *read* (non-scalar) compared to *eat an apple* and *read a book* (scalar)). Consequently, the presence of scalar particles and prefixes in a predicate makes the realization of a measured participant obligatory.[5] This participant is realized as either the unaccusative subject (e.g. *the lake froze up, the soup cooled down*) or the direct object (e.g. *the nurse cooled down the soup, the child read a book through*). Thus particles and prefixes can alter the argument structure of (optionally) intransitive verbs, turning them into obligatorily transitive particle verbs or prefixed verbs. As this also subsumes complex predicates with unselected objects (e.g. *dance the night away, sleep off a headache*), no separate treatment of these is necessary as far as aspect is concerned (contra Jackendoff 1997).

Third, the scalar theory allows us to explain how the aspectual value of the predicate can change with the addition (or change, in some cases) of sentence constituents, such as a direct object or a measure phrase, as illustrated in (4)–(6).

(4) a. Jake read.   (atelic)

     b. Jake read a book.   (atelic/telic)

(5) a. Jake ate.   (atelic)

     b. Jake ate an apple.   (telic)

(6) a. The lake cooled.   (atelic/telic)

     b. The lake cooled four degrees. (telic)

In the scalar analysis, these added sentence constituents either introduce a scale (such as *a book* and *an apple* in 4b and 5b) into the predicate, making it potentially telic,

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[5] Exceptions include dropping objects recoverable from context in Slovak and a few uses of some particle verbs, typically in imperative, in English (e.g. *Come on, eat up! Hey, wait up!*). Interestingly, van Hout (2000:fn. 1) gives similar Dutch examples of object drop in imperative (e.g. *Eet eens op!* 'Eat up!').

or mark a bound on the scale already present in the predicate (as *four degrees* does on the property scale lexicalized in *cool* in 6b), making the predicate unambiguously telic. As particles and prefixes can change the aspectual value of predicates (e.g. atelic/telic *read a book* and telic *read a book through*, and the Slovak counterparts atelic *čítať knihu* and telic *pre-čítať knihu*), the scalar theory of situation aspect is a suitable framework of analysis. Namely, scalar particles and prefixes can mark a bound on an open scale denoted in a predicate and thus function as telicity markers (e.g. *read a book* can be interpreted as involving an open scale, while *through* in *read a book through* marks a bound on the scale). Otherwise, scalar particles and prefixes require that the predicate be scalar, i.e. that a scale be present in the predicate, lexicalized in a suitable sentence constituent (e.g. *eat Ø/porridge/an apple* but *eat up *Ø/*porridge/an apple*). It has to be noted though that aspectual particles and prefixes do not lexicalize a scale themselves.

This paper treats situation aspect within the framework of lexical semantics in which aspectual features are built up in a monotonic compositional fashion (e.g. Olsen 1994; Rappaport Hovav and Levin 1998). Thus sentence constituents can expand a stative predicate into a dynamic one (e.g. stative *John resembles his father* to dynamic *John is resembling his father more and more*), a non-scalar predicate into a scalar one (e.g. non-scalar *read* to scalar *read a book*), and an atelic predicate into a telic one (e.g. atelic *run* to telic *run a mile*). However, only certain constituents can do so, namely if they are marked for a feature (e.g. atelic *run*, telic *run a mile*, and atelic *run miles*). I follow Olsen (1994) in treating aspectual features as privative rather than equipollent. In an equipollent binary opposition, a member is either marked or unmarked for a feature, e.g. [+telic] and [-telic]. This markedness or unmarkedness is not cancellable. In consequence, as Olsen points out, analyses that treat telicity as equipollent (e.g. Smith 1997:20) fail to account for the fact that a [-telic] predicate can be turned into a [+telic] predicate upon the addition of certain sentence constituents, but not contrariwise. A privative opposition is asymmetric; while one of the members is marked and uncancellable, the other unmarked member can become marked by certain linguistic or pragmatic contexts (e.g. *Lee ran* (unmarked for telicity) and *Lee ran a mile/to the store* (marked for telicity)). Marked features ([+dynamic], [+scalar], [+telic]) determine the overall aspect of a predicate and thus can override unmarked features ([0dynamic], [0scalar], [0telic]). Therefore, a 'clash' occurring between two (or more) constituents with different aspectual values presents no problem (e.g. *hear* [0dynamic] + *out* [+dynamic] = *hear out* [+dynamic]). Similarly, a doubled contribution of constituents is not problematic (e.g. *walk* [+dynamic] + *on* [+dynamic] = *walk on* [+dynamic]). Notice also that the doubled contribution goes beyond complex verbs (e.g. *come* [+telic] + *to the store* [+telic] = *come to the store* [+telic]).

If particles and prefixes describe the change denoted in the predicate as either scalar or non-scalar, as I propose, then, taking into account the monotonicity and compositionality of aspectual features (dynamicity, scalarity, telicity), the following predictions hold:

(7) If particles and prefixes describe the change denoted in the predicate, they cannot appear in stative complex verbs, as states do not denote any change, either scalar or non-scalar. Therefore, particle verbs and prefixed verbs are dynamic.

(8) Scalar particles and prefixes can alter argument structure, since scales require an obligatory realization of the measured event participant. This effect only concerns verb roots that are (optionally) intransitive. Non-scalar particles and prefixes do not alter argument structure.

(9) Since the denotation of a telic predicate must contain a bounded scale, only scalar particles and prefixes, but not non-scalar ones, can turn atelic predicates into telic ones. Nevertheless, scalar particles and prefixes do not necessarily mark telicity, for instance, when they refer to open scales.

The following sections support these predictions in turn with data from English and Slovak. Similarities and differences between the two languages are pointed out.

3. Particles, Prefixes and Stativity

Since dynamicity is built up in a monotonic compositional way (see previous section), a dynamic complex verb contains at least one constituent that is [+dynamic] (the other constituent being [+dynamic] or [0dynamic]), while a stative complex verb contains only constituents that are [0dynamic]. It follows that stative complex verbs can contain stative but not dynamic verb roots, whereas stative verb roots can be part of stative or dynamic complex verbs. However, English "[s]tative verbs such as *know, want, see, hear, hope, resemble,* etc. practically never combine with a particle", as Fraser (1976:11) observes.[6] The exceptions that result in dynamic particle verbs such as (10)–(11) are few and, as pointed out to me by one of the reviewers, triggered by a change in theta roles.

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[6] This paper only considers prototypical stative verbs, such as verbs of perception or mental attitude, as stative (cf. e.g. Novakov 2009). Therefore, I consider verb roots such as *sleep* and *sit* with an agentive subject as dynamic.

(10) a. Did you hear that? (*hear*, stative)

    b. Please, hear me out! (*hear out* 'listen to everything one wants to say', dynamic; example taken from The Free Dictionary online, http://idioms.thefreedictionary.com/hear+out)

(11) a. The garlic smells. (*smell*, stative)

    b. The garlic smelled out the kitchen. (*smell out* 'fill with smell', dynamic)

    c. The dog smelled out the drugs. (*smell out* 'find by smelling', dynamic)

In Slovak, prefixes freely combine with stative verbs. The resulting prefixed verbs are dynamic with an inchoative meaning, as shown in (12)–(13).[7]

(12) a. Anna   milovala   Jozefa.   (stative)   (Slovak)
      Anne.NOM loved.IPFV Joseph.ACC
     'Anne loved Joseph.'

    b. Anna   sa   za-milovala   do   Jozefa.   (dynamic)   (Slovak)
      Anne.NOM REFL PREF-loved.PFV into Joseph.ACC
     'Anne fell in love with Joseph.'

(13) a. Chlapec   videl   mačku.   (stative)   (Slovak)
      boy.NOM   saw.IPFV cat.ACC
     'The boy saw a cat.'

    b. Chlapec   u-videl   mačku.   (dynamic)   (Slovak)
      boy.NOM PREF-saw.PFV cat.ACC
     'The boy spotted a cat.'

Since complex verbs can be stative only if they contain a stative verb root and prefixes and particles turn stative verb roots into dynamic complex verbs, I conclude that the prediction postulated in (7) holds: particle verbs and prefixed verbs are dynamic. This supports the hypothesis that particles and prefixes describe the change denoted in the predicate.

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[7] This may be valid for other Slavic languages as well. Młynarczyk (2004:129) arrives at the same conclusion for Polish prefixes.

4. Particles, Prefixes and Argument Structure

Particles and prefixes differ in their ability to alter argument structure, depending on whether they are scalar or non-scalar. Non-scalar particles (e.g. in *sleep away, walk on, play around*) and prefixes appear in predicates in which there is no scale established by the theme's change of position, property, or volume/extent. They do not alter argument structure, as shown in (14)–(15).

(14) a. John and Mary danced.

b. John and Mary danced away. 'John and Mary kept on dancing.'

(15) a. Dieťa   (si)   spievalo.   (Slovak)
      child.NOM   (REFL)   sang.IPFV
     'The child sang (for him/herself).'

b. Dieťa   (si)   za-spievalo.   (Slovak)
      child.NOM   (REFL)   PREF-sang.PFV
     'The child sang (for him/herself) (for some time).'

While non-scalar particles have a continuative meaning (e.g. Celce-Murcia and Larsen-Freeman 1999:432), non-scalar prefixes have an attenuative ('a bit') and/or autobenefactive ('for oneself') meaning. The latter meaning is additionally carried in Slovak by the reflexive marker *si*, which combines with both prefixed and non-prefixed verb roots. *Si* is optional in both cases, although it may be pragmatically (dis)preferred in some contexts. I therefore do not consider (15) as a counterexample to prediction (8).

Scalar particles appear in predicates in which a scale is established by the theme's change of position along a path, e.g. *come up to someone* and *pri-behnúť* 'come running', the theme's change in property, such as temperature, e.g. *cool down* and *zo-hriať polievku* 'warm up the soup', or the theme's volume/extent incrementally involved in the event, e.g. *eat up an apple* and *po-staviť vežu* 'build a tower'. Scalar particles and prefixes in these predicates express a result or goal.

Scalar particles can alter argument structure, turning an optionally transitive verb root into an obligatorily transitive particle verb, as in (16). Particle verbs containing scalar particles can also license a direct object unselected by the verb root, as in (17).[8] This effect depends on the transitivity of the verb root; scalar particles do not alter argument structure of obligatorily transitive verb roots. This is shown in (18).

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[8] In this respect, both prefixed verbs and particle verbs behave like resultative constructions (e.g. *run the soles of your shoes *(bare)*). According to Jackendoff's (1997) analysis of the so-called 'time'-*away*

(16) a. Lisa drank (her milk).

     b. Lisa drank up *(her milk).

(17) a. Ally slept *a headache.

     b. Ally slept off *(a headache).

(18) a. I sent *(a parcel) to my sister.

     b. I sent off *(a parcel) to my sister.

Scalar prefixes have the same effect on argument structure, as shown in (19), including unselected direct objects, as in (20), unless the verb root is obligatorily transitive, as in (21) (see, for instance, Svenonius 2004; di Sciullo and Slabakova 2005).

(19) a. Líza   pila   (mlieko).   (Slovak)
        Lisa.NOM   drank.IPFV   (milk.ACC)
        'Lisa drank (milk).'

     b. Líza   vy-pila   *(mlieko).   (Slovak)
        Lisa.NOM PREF-drank.PFV (milk.ACC)
        'Lisa drank up *([a certain amount of] milk).'

(20) a. Víly   tancovali   *noc.   (Slovak)
        fairies.NOM   danced.IPFV   night.ACC
        'The fairies danced *the night.'

     b. Víly   pre-tancovali   *(noc).   (Slovak)
        fairies.NOM PREF-danced.PFV (night.ACC)
        'The fairies danced *(the night) away.'

(21) a. Gazda   na poli   pestoval   *(zemiaky).   (Slovak)
        farmer.NOM on field grew.IPFV   (potatoes.ACC)
        'The farmer grew *(potatoes) on the field.'

     b. Gazda   na poli   vy-pestoval   *(zemiaky).   (Slovak)
        farmer.NOM on field PREF-grew.PFV   (potatoes.ACC)

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construction, the unselected direct object is the direct object of the verb phrase rather than of the verb itself. I suggest this holds not only for English scalar particles but also for Slovak scalar prefixes (see below).

'The farmer grew *(potatoes) on the field.'

Slovak also has a special case of an argument structure effect that is not observed in English. In (22b), the prefixed verb licenses an obligatory reflexive marker *sa* unselected by the verb root.[9] This reflexive marker refers to the overt subject argument that measures out the event. It manifests the ability of scalar prefixes to alter argument structure and is therefore different from the optional autobenefactive marker *si* that combines with non-scalar prefixes, as in (15).

(22) a. Otec   *sa   jedol.   (Slovak)
          father.NOM   REFL   ate.IPFV
          'Father ate.'

    b. Otec   *(sa)   na-jedol.   (Slovak)
          father.NOM   (REFL)   PREF-ate.PFV
          'Father ate (himself full).'

Such cases arise when the scale is lexicalized in the subject argument – the event is delimited by the hunger/fullness of the *father*, realized as the subject argument in (22b). Such a case is not accounted for in Rappaport Hovav (2008), which is based on English data (cf. the English translation of (22b) by a resultative phrase). This type of scale is difficult to classify in Rappaport Hovav's (2008) framework. While volume/extent may seem the closest type for (22b), given the cognitive link between volume and 'fullness' as opposite to hunger, the same choice may be questioned for

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[9] Similar cases are found in German (i) and Dutch (ii). I owe (i) to Roman Sorger and (ii) to Jack Hoeksema (pers. comm.). Notice that German, Dutch, and Slavic languages generally use reflexives where English does not, e.g. 'to shave': *sich rasieren* (German), *zich scheren* (Dutch), *holiť sa* (Slovak) but *shave *oneself*.

(i) a. Der Student hat *sich   gelesen.   (German)
       the   student has   himself read
       'The student read.'

    b. Der Student hat *(sich)   ver-lesen.   (German)
        the   student has   (himself) PREF-read
        'The student misread.'

(ii) a. De student sliep *zich.   (Dutch)
       the   student slept   himself
       'The student slept.'

    b. De student ver-sliep *(zich).   (Dutch)
        the   student PREF-slept (himself)
        'The student overslept.'

Otec sa vy-spal 'Father slept (enough)'. Both carry a meaning component of 'to satisfaction'. Further examples of scalar verbs that are difficult to classify are *do-jesť* 'finish eating', *na-kúpiť* 'to buy a lot', and *na-fajčiť* 'to make a lot of smoke by smoking'. These data suggest that Rappaport Hovav's classification of scales might need to be adjusted for application to other languages. I tentatively assume the existence of a scale that measures a property of the event itself, such as intensity or temporal contour. For now, I leave the issue to future research.

An important disclaimer has to be made. Some forms, such as *away*, *za-*, and *po-*, can function either as non-scalar in intransitive complex verbs or as scalar in their transitive uses (e.g. *dance away* 'keep on dancing' (non-scalar)[10] and *dance away 5 kilos/my depression* 'to make 5 kilos/my depression go away by dancing' (scalar), *za-spievať (si)* 'sing (for some time)' (non-scalar) and *za-spievať (si) pesničku* 'sing a song' (scalar), *po-spať (si)* 'sleep (for some time)' (non-scalar) and *po-šliapať trávnik* 'trample a lawn' (scalar)). I therefore distinguish two uses of these forms, namely non-scalar *away₁*, *po-₁* and *za-₁*, and scalar *away₂*, *po-₂* and *za-₂*. It also has to be noted that English has a richer variety of non-scalar particles (*about, along, (a)round, away₁, on*) than Slovak (*po-₁* and *za-₁*). In addition, Slovak lacks exclusively non-scalar prefixes since *po-* and *za-* can also be used as scalar (see the examples above). In contrast, out of English non-scalar particles, only *away* can also function as scalar.

To sum up, this section supports prediction (8): Scalar but not non-scalar particles and prefixes alter argument structure.

5. Particles, Prefixes and Telicity

This section reviews the ability of particles and prefixes to mark telicity. In order to test telicity, I use the standard *for/in X time* adverbial test from Dowty (1979:60) and its Slovak counterpart, the use of preposition *za*. Atelic predicates are compatible with *for time* adverbials, but not with *in time* adverbials. In Slovak, adverbials without preposition *za* are compatible with atelic predicates while adverbials with *za* are not (ingressive reading excluded in both languages). This is shown in (23).

(23) a. Mary ran for/*in an hour.   (atelic)

     b. Mária   bežala   (*za) hodinu.   (atelic)   (Slovak)

       Mary.NOM   ran.IPFV   (in)   hour

      'Mary ran for/*in an hour.'

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[10] Note that the particle verbs with non-scalar *away* can occur in conative frames, e.g. *Billy bashed away at the piano* (example from Jackendoff 1997:540).

Telic predicates behave the other way round: they are acceptable with *in time* adverbials, but not *for time* adverbials, as shown in (24).

(24) a. John built a house *for/in a month.   (telic)

b. Ján   po-stavil   dom   *(za)   mesiac.   (telic)   (Slovak)
   John.NOM PREF-built.PFV house.ACC (in)   month
   'John built a house *for/in a month.'

Nevertheless, some predicates in English are aspectually ambiguous, allowing for both an atelic and a telic interpretation, as in (25).

(25)   The child read a book for/in 10 minutes.   (atelic/telic)

Let me now review what contribution particles make to telicity of predicates. Non-scalar particles and prefixes do not mark telicity, as shown in (26)–(27).

(26) a. The children walked in silence for/*in a long time.   (atelic)

b. The children walked on in silence for/*in a long time.   (atelic)

(27) a. Ján   (si)   (*za)   hodinu   spal.   (atelic)   (Slovak)
    John.NOM (REFL) (in)   hour   slept.IPFV
    'John slept for/*in an hour.'

b. Ján   (si)   (*za)   hodinu   po-spal.   (atelic)   (Slovak)
   John.NOM (REFL) (in)   hour   PREF-slept.PFV
   'John slept for/*in an hour.'

In Filip's (1999:201–203) view, predicates with *po-*, such as (27b), are telic because the prefix measures the event. For her, predicates that denote events bounded in time (e.g. *walk for an hour*) are telic (see also Filip 2003:59–60). In contrast, I do not consider perfective prefixed verbs with delimitative *po-*, as in (27b), telic since they do not denote an event with an inherent culmination point, but merely an event with an arbitrary endpoint, that is, a temporally bounded process. The atelicity of these verbs is manifested by the acceptability of occurring with *for time* adverbials. With an *in time* adverbial, the verb has only an ingressive reading, which points to its atelicity.

Scalar particles can mark telicity, as in (28), but they do not always do so, as in (29b), which retains both an atelic and a telic interpretation despite the presence of *up*. Notice, however, that (28) denotes a volume/extent type of scale, while (29) denotes a

property type of scale (see Table 1). Indeed, the telicity marking effect of scalar particles depends partly on the type of scale lexicalized in the predicate, as I argue in Walková (2013).

(28) a. Lisa drank her milk for/in five minutes.   (atelic/telic)

    b. Lisa drank up her milk *for/in five minutes.   (telic)

(29) a. Grandma warmed the soup for/in five minutes.   (atelic/telic)

    b. Grandma warmed up the soup for/in five minutes.   (atelic/telic)

Slovak scalar prefixes mark telicity, as in (30), but, unlike English particles, they always do so regardless of the type of scale, as shown in (31).[11,12]

(30) a. Líza   pila   mlieko   (*za) päť   minút.   (atelic) (Slovak)
    Lisa.NOM   drank.IPFV milk.ACC (in)   five   minutes
    'Lisa drank milk for/*in five minutes.'

    b. Líza   vy-pila   mlieko   *(za) päť   minút.   (telic) (Slovak)
    Lisa.NOM   PREF-drank.PFV milk.ACC (in)   five   minutes
    'Lisa drank up the milk *for/in five minutes.'

(31) a. Babka   hriala   polievku (*za) päť minút.   (atelic) (Slovak)
    grandma.NOM   warmed.IPFV soup.ACC (in)   five minutes
    'Grandma warmed the soup for/*in five minutes.'

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[11] One can assume that this is true not only for Slovak but also for other Slavic languages, as Milićević (2004:29) finds the same for Serbian.

[12] At present, I have no explanation for why scalar prefixes, unlike scalar particles, always mark telicity. This seems to be part of the parametric variation among languages in the encoding of telicity (see e.g. van Hout 2008 and references therein). Telicity in English is a compositional property of the verb phrase rather than only of the verb, as it depends not only on the verb root, but also the direct object, prepositional phrase, measure phrase, and/or particles. In contrast, Slavic languages exploit a 'verb-marking strategy' to encode telicity, i.e. telicity in Slavic languages is dependent on the verb only and not on other sentence constituents. Notice also that English, unlike Slovak, allows for aspectually ambiguous predicates. Moreover, the phenomenon is not directly related to the absence of articles in Slavic languages (note that articles play a major role in marking telicity via quantification in English, e.g. atelic *eat apples* compared to telic *eat an apple*), as it is not restricted to Slavic languages that lack articles, but applies also to Slavic languages with articles, as suggested by di Sciullo and Slabakova's (2005) study of Bulgarian. The fact led Slabakova (2001) to propose a lower phrase structure position for particles in English and a higher one for prefixes in Bulgarian.

    b. Babka   zo-hriala   polievku *(za) päť minút. (telic) (Slovak)

      grandma.NOM PREF-warmed.PFV soup.ACC (in) five minutes

     'Grandma warmed up the soup *for/in five minutes.'

In addition, prefixes mark not only telicity (situation aspect) but also perfectivity (see Section 2). Perfectivity marking concerns both types of prefixes: (30b), (31b) and also (27b) are all perfective. The interaction between situation and grammatical aspect has an important consequence: It has to be noted that testing telicity in Slavic languages, such as in (30a) and (31a), is problematic due to the fact that the unprefixed verbs are imperfective. What is crucial for determining telicity is whether the predicate denotes an inherent culmination endpoint of a situation. Imperfective aspect, however, views only part of a situation and thus does not include its endpoint (see Section 2). The imperfective simply does not 'see' the endpoint, and imperfective verbs always appear as atelic (see Smith 1997:231–234). However, I assume (30a) and (31a) to be uncontroversially atelic, with the verbs referring to the processes of milk drinking and soup warming without a culmination point and roughly corresponding to 'engage in a drinking process' and 'cause to become warmer', respectively.

The same applies to the so-called secondary imperfectives, that is, imperfective verbs composed of a perfective prefixed stem and an imperfectivizing suffix, which in a way over-rules the original perfective value of the prefixed stem (e.g. *zo-hrie-vať* PREF-warm-SUFF 'warm' (imperfective)). I propose that a scalar prefix in secondary imperfectives marks not only perfectivity but also telicity, so the prefixed stem is perfective and telic. However, the culmination point is not visible in the imperfective (grammatical) aspect, so a secondary imperfective verb appears as atelic. Therefore, the existence of secondary imperfectives does not run counter to the claim that scalar prefixes always mark telicity. Instead, grammatical and situation aspect should be treated separately (e.g. Smith 1997; de Swart 1998; Borik and Reinhart 2004), with the former functioning as an aspectual operator over the latter.

This section has shown that scalar but not non-scalar particles and prefixes mark telicity, providing support for prediction (9). While the telicity marking effect is obligatory for prefixes, it is optional for particles.

6. Comparison with Previous Accounts

I have shown that the predictions postulated in (7)–(9) hold for both English particles and Slavic prefixes: (i) Prefixed verbs and particle verbs are dynamic. There are two kinds of particles and prefixes with different effects on argument structure and

telicity:[13] scalar but not non-scalar particles and prefixes can (ii) alter argument structure and (iii) mark telicity. This section compares my proposal to the proposals of other researchers.

While there exists literature on Slavic prefixes that distinguishes between two types of prefixes (see Section 1), such a systematic distinction in English particles has been lacking. To the best of my knowledge, the only exception is McIntyre's (2001, 2004, 2007) distinction between intransitive and transitive (atransitive and non-atransitive in McIntyre's terms) uses of particles. His distinction roughly corresponds to mine. At the same time, though, McIntyre (2001:136–137) rejects a connection between transitivity and telicity because the two do not correlate; namely, non-scalar particles block all kinds of direct objects, not only those that delimit an event (e.g. *he played (*his guitar) along/around/away/on*). In addition, McIntyre (2001:137) tentatively proposes that particles that block direct objects may do so by blocking case assignment by the verb. However, McIntyre does not elaborate on the idea further because he misses an independent motivation for the different syntactic behaviour of the two types of particles. My proposal based on scalarity might serve as such an independent motivation. For now, I leave the issue to future research.

There are also other accounts of Slavic prefixes based on an underlying scalar structure (e.g. Součková 2004; Filip 2008; Kagan 2012). In Filip's (2008:217) account, prefixes play a role in specifying the scale that underlies telicity. For her, all prefixes imply a scale, yet only perfective prefixed verbs are telic. However, as seen in (27b), there are also perfective prefixed verbs that are atelic. In addition, Filip views transitivity of most prefixed verbs as motivated by underlying scalarity and claims that prefixed verbs are intransitive when the entity measured by the scale can be retrieved from the context. In contrast, in my account, the argument structure of prefixed verbs is seen as being determined by scalarity or its absence.

Along the lines of Filip's earlier work, Součková (2004) discusses Czech superlexical prefix *po-* and argues that its different meanings can receive a unified analysis when understood as containing an extensive measure function of events, meaning 'a little'. This prefix can either measure or delimit an available scale (and consequently the event). This scale, in Součková's view, can be a path scale, a property scale, or a temporal scale.

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[13] See van Hout (1996) for similar observations in Dutch (e.g. *door-schrijven* 'write on' and *mee-lezen* 'read along' (intransitive, atelic) compared respectively to *af-schrijven* 'finish writing' and *uit-lezen* 'finish reading' (transitive, telic)). In my interpretation, particles *door* 'on' and *mee* 'along' are non-scalar and particles such as *af* 'off' and *uit* 'out' are scalar. Van Hout (1996: fn. 96) also notes that *door* is ambiguous between the uses, just like English *away* and Slovak *za-* and *po-*.

Kagan (2012) discusses two Russian prefixes: lexical *pod-* and *do-*, which has properties of both lexical and superlexical prefixes. Kagan (2012:209) proposes that "a verbal prefix imposes a relation between two degrees on a scale, one of which is a degree associated with the event denoted by the verbal predicate, and the other, the standard of comparison." Namely, for *pod-* the degree associated with the event is lower than the standard of comparison (e.g. *pod-rasti* 'grow (up) a little bit'), and for *do-* the degree associated with the event is the same as the standard of comparison (e.g. *do-čitať knigu* 'finish reading a book'). The standard of comparison is determined either by linguistic material in the sentence or contextually.

Overall, the difference between my account on one hand and Součková (2004) and Kagan (2012) on the other is that the latter accounts treat my non-scalar prefixes as scalar ones, the scale being one of time. This seems to be an *ad hoc* solution, as all events occur over a time span and therefore can be said to progress along a temporal scale. In addition, an approach that treats all prefixes uniformly as scalar fails to explain why the two types of prefixes have different effects on argument structure and telicity. However, these differences can be accounted for, as I hope to have shown in this paper, by analysing internal/lexical prefixes as scalar and external/superlexical prefixes as non-scalar.

7. Conclusion

This paper has shown that English aspectual particles and Slovak aspectual prefixes both come in two types which exhibit systematic behaviour in terms of dynamicity, telicity, and argument-structure effects. These phenomena can be successfully analyzed in terms of scalarity underlying aspect. Particle verbs and prefixed verbs are always dynamic. They describe the change denoted in the verb root as either scalar or non-scalar. Scalar, but not non-scalar, particles and prefixes can alter argument structure and mark telicity.

While the data demonstrate the predictive power of a theory of situation aspect based on scales, they also reveal that the theory, when applied cross-linguistically, has its weaknesses which still need to be addressed. In particular, future research should aim at discovering whether there are also other types of scales beyond the basic three (path, property, volume/extent) and whether there is further parametric variation among languages with respect to scales.

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