

Chapter #

QUANTIFICATION AND ASPECT

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Abstract: This paper brings forward new data in support of the asymmetric properties of aspect features, as defined in Di Sciullo (1997) on the basis of Romance languages. We show that prefixes encoding terminativity (internal [T]) impose a specific reading not only on determinerless DPs in languages like Russian, Czech and Polish, but also on overtly unspecified cardinality DPs as in Bulgarian. Furthermore, only a subset of Bulgarian prefixes are identified as capable of encoding the internal [T] feature. We argue against the traditional view that Slavic perfective prefixes are a homogeneous group. Outside the VP-level, specific readings of DPs provide evidence for another terminative (external [T]) feature taking asymmetric scope over arguments (subjects as well as objects). We propose that A-quantification, [T] calculus, and its effect on D-quantification, are obtained compositionally given the configurational asymmetry between external [T] and internal [T] in phrase structure. We refer to this hypothesis as the [T]/[T] asymmetry hypothesis. One desirable consequence of this hypothesis is that it allows for the elimination of AspP in the derivation of linguistic expressions.

Key words: aspect calculation, terminativity, quantification, nominal interpretation, definiteness

1. INTRODUCTION

In this paper, we focus on the relations between structure and interpretation in natural languages and the contributions of morphological and syntactic feature structures to D- and A-quantification calculi.

Since the work of Lewis (1975), Heim (1982), and Kamp (1981), it has been accepted that natural languages express quantificational notions in two different ways: through determiners normally forming a constituent with a projection of N in the Determiner Phrase (DP) (e.g., *every dog*, *all birds*) and through adverbial-type words and morphemes forming a constituent with some projection of the verb. The terms A- and D-quantification were first introduced in Partee, Bach, and Kratzer (1987): “‘D’ is mnemonic for Determiner, ‘A’ for the cluster of Adverbs, Auxiliaries, Affixes, and Argument-structure Adjustors, all of which can be thought of as alternative ways of introducing quantification in a more ‘constructional’ way (Carlson, 1983).” (Bach, Jelinek, Kratzer, and Partee, 1995: 8).

We focus on the expression of A-quantification through verbal means, i.e., the affixes and argument-structure adjustors of the quotation above. In languages such as English, the definite feature on a DP or a PP complement is related to the aspectual structure of the verbal projection it is a part of (Tenny, 1994, among other works). In Romance languages, functional features, e.g., the terminative feature, may have an effect on the aspectual properties of verbal projection (Di Sciullo 1997, 1999, and forthcoming). In Slavic, perfective prefixes have been proposed to function as A-quantifiers contributing a specific reading to the whole VP (Filip 1992, 1993; Piñon 1995), (see examples in section 2 below). We bring forward new data from Slavic sentences and verbal forms in support of the claim that prefixes encoding telicity impose a specific reading not only on determinerless DPs in languages like Russian, Czech and Polish, but also on overtly unspecified cardinality DPs as in Bulgarian. We use the object-denotation of DPs as evidence for a terminative [T] feature taking asymmetric scope over arguments (subjects as well as objects). We propose that A-quantification, [T] calculus, and its effect on D-quantification, are obtained compositionally given the configurational asymmetry between external [T] and internal [T] in phrase structure. We refer to this hypothesis as the [T]/[T] asymmetry hypothesis.

We assume a model of grammar where morphological and syntactic structure are based on asymmetrical relations, but differ with respect to the realization of the asymmetry.¹ In tune with the Minimalist program (Chomsky 1995-2001), we take the derivation of words not to coincide with the

derivation of phrases. Fully inflected lexical items are part of the numeration, and their formal features are checked in the syntactic derivation. We also assume Asymmetry Theory (Di Sciullo, 1999, 2002, and forthcoming), where morphological expressions and syntactic expressions are derived in different planes of the computational space by different instances of generic operations and economy conditions.² This theory is based on the hypothesis that asymmetry is the core relation of the language faculty. Asymmetry is central in the derivation of morphological objects, as the primes of morphological derivations are minimal trees. Asymmetry is achieved as early as possible in the syntactic derivations, and it must be obtained at the interfaces, semantic and phonetic. Thus, there is a core difference in the derivation of morphological and syntactic objects. The fact that the elements of a morphological object cannot be inverted, contrary to what can be observed in certain syntactic objects, e.g., predication structures, strongly supports the proposed divide. Relevant to this paper is the fact that derived morphological relations will not be able to be modified in the course of syntactic derivations. In particular, the effect of the adjunction of an aspectual affix to a verbal root cannot be altered by a temporal feature in the syntactic derivation of a proposition. Moreover and interestingly, in Slavic languages lacking overt determiners, the presence of an aspectual affix on a verbal root is sufficient to determine the terminativity of a verbal projection. No overt definite DP object is required. These facts point to the correctness of our theory, where morphological and syntactic derivations are parallel, as well as to the crucial importance of relating Aspect and asymmetry.

2. PERFECTIVITY AND SPECIFICITY

The parallel between perfectivity and object specificity has been widely discussed in the literature on English, Romance and Slavic aspect. In English, quantized nominal arguments linked to the Incremental Theme (Dowty, 1991) combined with dynamic verbs bring forward a telic interpretation as in (1); cumulative Incremental Theme objects contribute to an atelic interpretation as in (2) (Verkuyl, 1972; Krifka, 1998).

- | | | |
|-----|---|---------------|
| (1) | Claire ate an apple/the apple/three apples/a bag of popcorn | <i>telic</i> |
| (2) | Claire ate apples/popcorn | <i>atelic</i> |

- (6) Ivan z-gotvi jadene i go izjade dokato beše gorešto
 Ivan PV-cook-AOR/3sg stew and it ate while was hot
 ‘Ivan cooked some stew and ate it while it all was hot.’

In summary, perfective prefixes encoding telicity impose a specific reading not only on determinerless DPs in languages like Russian, Czech and Polish, but also on overtly unspecified cardinality DPs like the ones in Bulgarian. It is important to keep in mind, in the following sections, that we use bare plurals and mass nouns, grouped together under the label Bare Nouns, to show quantificational effects of verbal predicates over nominal arguments. Bulgarian bare nouns are particularly well suited for such a demonstration, since, parallel to Romance bare nouns and unlike English bare nouns, they behave as indefinites, à la Heim (1982), i.e., quantificational variables existentially or generically bound (Longobardi, 2001). Hence, they can only obtain their existential or generic interpretation through existential or generic quantifiers independently provided by the sentence logical form. As argued below, in our system, existential closure is provided by instances of the terminative feature [T].

3. LEFT PERIPHERY

The literature on Slavic aspect usually discusses verbal prefixes as a group of affixes that produce perfective verbs out of imperfective roots. But not all verbal prefixes traditionally classified as “perfective” prefixes have the same effect over argument DPs. In this section we will discuss a division in the traditionally considered as homogeneous group of verbal prefixes, proposed originally for French aspectual prefixes in Di Sciullo and Klipple, 1994; Di Sciullo, 1997, 2000; see also Babko-Malaya, 1999 for a similar distinction between “lexical” and “superlexical” prefixes.

3.1 *French and Italian Prefixes*

Di Sciullo (1997) shows that there is a configurational asymmetry between INTERNAL (directional and locational) and EXTERNAL (iterative and inverse) prefixes in morphological structure.

In Romance languages, the configurational asymmetries between internal and external prefixes determine their linear order and their effect on the verbal structure. Thus, an external prefix (temporal-sequential, iterative or inverse) modifies the full verbal projection but does not affect its argument structure or internal aspect. In contrast, an internal prefix (spatial) affects the internal aspect of the verbal projection, and in some cases, its argument structure as well. In denominal and deadjectival verbs, the argument and aspectual properties of the verbal complex are dependent on both the prepositional prefix and the verbal suffix.

The Internal/External Prefix Hypothesis correctly predicts the following properties of prefixed verbs in Romance. Some examples from French and Italian are provided below. See Di Sciullo (1997) for further discussion of the Romance facts, which we summarize as follows.

Firstly, external prefixes must precede internal prefixes, as illustrated in (7)

- (7) a. *apportare, riapportare*, vs. **ariportare* (Italian)
 ‘to bring to’, ‘to bring again’, ‘to bring to again’
 b. *empporter, réempporter*, vs. **enréporter* (French)
 ‘to bring with’, ‘to bring with again’

Secondly, in denominal and deadjectival verbs, an internal prefix must follow an external prefix, as illustrated in (8).

- (8) a. *imbarcare, riimbarcare*, vs. **ribarcare, *imribarcare* (Italian)
 ‘to embark’, ‘to embark again’
 b. *embarquer, réembarquer*, vs. **rebarquer, *emrebarquer* (French)
 ‘to embark’, ‘to embark again’

Thirdly, as they are part of the argument structure domain of the verb, internal prefixes may not be iterated and may not co-occur, external prefixes may sometimes be, this is illustrated in (9).

- (9) a. (?) *ririfare, ridisfare*, vs. **aa/inimportare, *aim/inapportare* (Italian)
 ‘to repeat again’, ‘to reundo’, ‘to bring to to’, ‘to bring to from’
 b. (?) *rerefaire, redéfaire*, vs. **aa/enempporter, *aem/emapporter* (French)
 ‘to redo’, ‘to reundo’, ‘to bring to to’, ‘to bring to from’

Fourthly, internal prefixes may affect the aspectual class, and the argument structure of the projection they are adjoined to, external prefixes cannot, see (10). As is well-known, the difference in the appropriateness of a punctual or a

durative adverbial modification indicates whether the event denoted by the verbal predicate has or not a natural end point or Terminus.

- (10) a. Ha (ri)dormito (per ore/?in un ora). (Italian)
 ‘He slept again (for hours/?in an hour).’
 b. Ha addormentato Gianni (subbito/?per ore).
 ‘(S/He) made Gianni sleep (right away/?for hours).’
 c. Il a (re)dormi pendant des heures. (French)
 ‘He slept again for hours.’
 d. Il l’a (r)endormi immédiatement.
 ‘He made him sleep again immediately.’

Finally, as internal prefixes may change the telicity of the verbal predicate they are adjoined to, they may not adjoin to telic predicates, whereas external prefixes can; this is illustrated in (11).

- (11) a. *anascere, *aeplodere, *avincere (Italian)
 ‘to be born at’, ‘to explode at’, ‘to win at’
 b. rinascere, riesplodere, rivingere
 ‘to be born again’, ‘to explode again’, ‘to win again’
 c. *anaître, *aexplorer, *agagner (French)
 ‘to be born at’, ‘to explode at’, ‘to win at’
 d. renaître, réexplorer, regagner
 ‘to be born again’, ‘to explode again’, ‘to win again’

The configurational asymmetry between external and internal prefixes is depicted in (12).

- (12) [_V External prefixes [_V Internal prefixes V]]

The configuration in (12) expresses correct semantic and syntactic properties of prepositional prefixation in a Romance verbal projection. Semantically, internal prefixes may change the telicity of the verbal projection they are part of, whereas external prefixes do not have this effect. The external/internal prefix hypothesis accounts for the linear order properties of prefixes: i) external prefixes must precede internal prefixes; ii) external prefixes may be iterated and co-occur, while internal prefixes, as they are in the argument-structure domain of a verbal projection cannot be iterated and cannot co-occur; iii) in denominal and deadjectival verbs, an internal prefix must follow an

external one in the verbal construct; iv) internal prefixes are part of the argument-structure domain of a verbal projection, and thus they may affect the argument structure of the projection they are adjoined to, as well as the aspectual class of the verbal projection; v) finally, as internal prefixes may change the telicity of the verbal projection they are a part of, they cannot be adjoined to telic predicates, whereas, external prefixes are not subject to this restriction, as they do not affect the telicity of the event they are adjoined to.

3.2 *Internal/External Prefixes in Bulgarian*

In this section, we provide evidence that the Internal/External prefix hypothesis extends to other languages, by considering the properties of prefixes in Bulgarian verbs.

In Bulgarian, the prefixes *pre-* ('repeated action') and *po-* ('briefly') have adverbial properties in (13) and (14) in the sense that they provide adverbial-like modification to the eventuality denoted by the root. On the other hand, the prefix *na-* 'on' has prepositional properties. It does not contribute anything to the verbal root meaning except telicity, an inherent endpoint to the eventuality as in (15). It can be regarded as a pure telicity marker (not contributing any idiosyncratic lexical information to the root apart from an endpoint) as opposed to the adverbial prefixes *pre-* and *po-* in (13) and (14).

- | | | |
|------|-------------------|-----------------------------|
| (13) | bojadisam 'paint' | pre-bojadisam 're-paint' |
| (14) | četa 'read' | po-četa 'read for a while' |
| (15) | piša 'write' | na-piša 'write out in full' |

We analyze *pre-* and *po-* as external prefixes and *na-* as an internal one. Crucially, we will show that whenever the prefix has an effect on the verb's argument structure and/or lexical semantics, it must be an internal prefix. To anticipate the analysis in section 4, we will argue that only internal prefixes, but not external ones, can contribute telicity, or the [T] feature, to the composition of verbal aspect.

3.3 *Predictions*

The configurational difference between prefixes accounts for the linear order properties of prefixes in Bulgarian. The analysis correctly predicts that an external prefix must precede an internal one, the reverse order being ungrammatical, as illustrated below.

- (16) a. pro-četa ‘read in full’
 b. pre-pro-četa ‘read in full once again’
 c. *pro-pre-četa ‘read in full once again’

Furthermore, whenever prefixes are attached onto an adjectival root, e.g. *red, fat*, externals can attach to the root only after internals have already attached.

- (17) a. červja ‘make red’ *atelic*
 b. na-červja ‘reddden’ *telic*
 c. *pre-červja ‘reddden again’
 d. pre-na-červja ‘reddden again’
 e. *na-pre-červja ‘reddden again’
- (18) a. debeleja ‘get fat’ *atelic*
 b. na-debeleja ‘get fat’ *telic*
 c. *po-debeleja ‘get a little fat’
 d. po-na-debeleja ‘get a little fat’
 e. *na-po-debeleja ‘get a little fat’

A second prediction is that external prefixes can be iterated, while internal prefixes supplying the endpoint of the event cannot.

- (19) a. pre-pre-iz-bra ‘re-re-elect’
 b. *iz-iz-bra ‘elect’
 c. pre-pre-čerta ‘re-re-draw’
 d. *na-na-čerta ‘finish drawing’

Thirdly, when more than one prefix occur on a given stem, it is only one of them that supplies the endpoint of the event; the others offer additional meanings similar to adverbial manner modification. Take the examples in (20). The prefix *s-* in (20c) supplies the end point, the prefix *po-* in (20b,d) offers an attenuative meaning of doing something for a little while or to a small degree, and the prefix *iz-* encodes distributivity of the event over a lot of participants.⁴ Both *karax se* and *po-karax se* in (20a,b) are grammatical with a durational adverbial like *for an hour*, while the telic verbs in (20c-e) are not. Note also that the adverbial-like prefix *po-* means ‘for a while’ when attached to the atelic root, but it changes its meaning to ‘a little’ when added onto an already telic stem.

- (20) a. karax se ‘I quarrelled’ *atelic*
 b. po-karax se ‘I quarreled for a while’ *atelic*
 c. s-karax se ‘I quarrelled’ *telic*
 d. po-s-karax se ‘I quarreled a little’ *telic*
 e. iz-po-s-karax se ‘I quarreled with everyone’ *telic*

Fourthly, and most importantly, the external iterative prefix does not alter the aspectual class of the verb, while internal prefixes do so, since they signal telicity. In order to illustrate that, compare the interpretations of (21) where the verb has an internal prefix and (22) where the verb has an external prefix:

- (21) xudožnikət na-risuva kartini za pet časa/*pet časa
 the painter PV-paint-AOR/3sg pictures in five hours/*for five hours
 ‘The painter painted some pictures in five hours/*for five hours.’
 (22) xudožnikət pre-risuva kartini ?za pet časa/pet časa
 the painter PV-paint-AOR/3sg pictures in five hours/for five hours
 ‘The painter re-painted (some) pictures ?in five hours/for five hours.’

In (21) the presence of the internal prefix brings forward a telic interpretation, although the direct object is a bare plural noun. In (22) both a telic and an atelic interpretation are available, as the time adverbial tests show. The actual interpretation of the sentence will be based on discourse context or temporal adverbials positioned higher in the structure.

Furthermore, as shown in (23), some internal prefixes can add a causer to the argument structure of intransitive verbs.

- (23) a. decata se smjaxa na klouna
 the children REFL laugh-AOR/3pl at the clown
 ‘The children laughed at the clown.’
 b. klouna raz-smja decata
 the clown PV-laugh-AOR/3sg the children
 ‘The clown made the children laugh.’

Thus, internal prefixes have an effect both on the lexical aspectual class and on the argument structure of the verbal root they attach to.

Some more evidence for the above analysis comes from biaspectual verbs in Bulgarian. There are some borrowed verbs in Bulgarian like *organiziram* ‘organize’, *arestuvam* ‘arrest’, *remontiram* ‘repair’. As late borrowings into

the language, biaspectual verbs do not employ prefixes to become perfective (Kabakčiev, 1984). They do not follow the typical pattern of Bulgarian verbs:

- (24) imperfective (activity) root = atelic verb
 perfective prefix + imperfective (activity) root = telic verb

Crucially, those verbs behave very much like English eventive verbs: the cardinality of the DP object determines the interpretation. These verbs are ungrammatical with an endpoint of the event prefix like *na-*, as (26) indicates. Since these verbs use English-type telicity marking, they do not allow telicity to be marked redundantly twice, through the internal prefix. On the other hand, as is the case for Romance and English, the iterative prefix *pre-* can appear with these verbs without changing their aspectual class, cf. (27). Thus, the syntactic behavior of these biaspectual verbs confirms the status of internal prefixes as telicity markers and of external prefixes as adverbial modifiers.

- (25) a. mexanicite remontiraxa koli *atelic*
 the mechanics repair-PAST/3pl cars
 'The mechanics repaired cars.'
 b. mexanicite remontiraxa kolite *telic*
 the mechanics repair- PAST/3pl the cars
 'The mechanics repaired the cars.'
- (26) a. *mexanicite na-remontiraxa koli
 b. *mexanicite na-remontiraxa kolite
- (27) a. mexanicite pre-remontiraxa koli *atelic*
 the mechanics PV-repair- PAST/3pl cars
 'The mechanics repaired cars again.'
 b. mexanicite pre-remontiraxa kolite *telic*
 the mechanics PV-repair- PAST/3pl the cars
 'The mechanics repaired some cars again.'

To summarize this section, we have shown that certain verbal prefixes in Bulgarian may affect the internal aspectual properties and in particular the telicity of the VP they are adjoined to, as originally argued for in Di Sciullo (1997, 1999) on the basis of Romance verbs. In particular, we have provided evidence to show that it is only internal but not external prefixes in Slavic that act as A-quantifiers and change the interpretation of argument DPs. Thus we

have qualified the traditional approach, which assumed that all perfective prefixes in Slavic bring forward a specified cardinality interpretation in nominal phrases.⁵

4. [T] VERBS

Not only are some Slavic perfective prefixes exempt from A-quantifier status, but there are some roots that can be classified as such. We will show that the lexical sub-event feature Terminative [T] has a similar semantic effect in Slavic as overt perfective morphemes.

We assume the system of aspectual features proposed by Di Sciullo (1997), according to which eventuality types, first proposed by Vendler (1967), can be defined in terms of two features: Terminative [T] and Subinterval [S]. Thus we have: states:[,]; achievements: [,T]; activities:[S,]; accomplishments:[S, T]. As discussed in Di Sciullo (1997) on the basis of Romance, the bivalent aspect features system allows one to identify natural classes of categories with respect to aspect.⁶ Thus some verbs and prepositions form a natural class with respect to the [T] feature, other elements do not. Moreover, given the Adjunct Identification Condition (Di Sciullo 1997: 57), according to which an adjunct identifies an unspecified feature of the category it adjoins to, it follows that a [T] prepositional prefix cannot be adjoined to a [T] verb. See the examples in (11a) and (11c) repeated here in (28) for convenience.

- (28) a. *anascere, *aeploedere, *avincere (Italian)
 ‘to be born at’, ‘to explode at’, ‘to win at’
 b. *anaître, *aexplorer, *agagner (French)
 ‘to be born at’, ‘to explode at’, ‘to win at’

This prediction derived from the behavior of Romance verbs and prefixes, turns out to hold for Slavic as well. An internal [T] prefix may not be adjoined to an achievement, as this predicate is lexically, or inherently, a [T] verb.⁷

- (29) a. kupja ‘buy’ *telic*
 b. iz-kupja ‘buy all the available goods’ *adverbial meaning*
 c. na-kupja ‘buy in big quantities’ *adverbial meaning*
 d. *na-kupja ‘finish buying’ *double telic*

The following examples from Russian (30) and Polish (31) contain the achievement verbs *buy* and *give*, which are perfective roots, lexically marked [T] roots, and do not need a perfective prefix to denote a telic event (with the same lexical meaning, see endnote 4) (Slabakova, 2001a). Note that the DP object reading is of a specific quantity of material.

- (30) ja kupila material (šit' plat'ye) (Russian)
 I buy-PAST material-ACC (to make a dress)
 'I bought all the necessary material (for a dress).'
- (31) (ja) dałam chłopcu pieniądze (Polish)
 I give-PAST boy-DAT money-ACC
 'I gave the boy the money.'

Bulgarian exhibits a similar phenomenon that we observed in section 2 with perfective prefixes. Although the object is a mass noun, marked indefinite by the lack of determiner on it, it is still interpreted as a specific quantity of money, as the pronoun indicates. This is due to the [T] feature of the verbal root.⁸

- (32) Ivan dade pari na Marija i tja gi po-xarči
 Ivan give-AOR/3sg money to Maria and she it PV-spend-AOR/3sg
 za den
 in a day
 'Ivan gave Maria a quantity of money and she spent it in a day.'

The facts discussed in this section extend the empirical coverage of the feature analysis of aspect as well as the restrictions on the adjunction of internal [T] prefixes to [T] verbal predicates. In a nutshell, within the verbal projection, only one [T] feature can be active, supplied either by a lexically telic root, or a perfective prefix, or an object of specified cardinality.

5. ASPECTUAL TENSES AND TERMINATIVITY AT THE RIGHT PERIPHERY

Depraetere (1995), following Declerck (1989), argues for the necessity of a new distinction in evaluating the aspectuality of sentences. Vendler's (1967)

four aspectual classes, states, activities, accomplishments and achievements, are partially based on the distinction of telicity, the availability or unavailability of potential inherent endpoints in the events. Thus, states are outside (tangential to) this distinction pertaining to the dynamic aspectual classes only, and of the latter, activities are atelic, while accomplishments and achievements are telic. Dowty's (1979) Imperfective Paradox shows the effect of the progressive on telic events: the progressive form seemingly "takes away" the built-in endpoint in accomplishment sentences as *John was drawing a circle*. Such sentences clearly demonstrate the need for two aspectual distinctions: one based on potential endpoints (telicity) and the other based on actual endpoints, which is labeled boundedness. The two distinctions are exemplified below with sentences from Bulgarian which vary in the presence or absence of perfective prefix, and in the two aspectual tenses: aorist and imperfect.

- (33) (PREFIX + AORIST = *telic, bounded*)
 Ivan pro-čete Vulšebnata planina ot Tomas Man.
 Ivan PV-read-AOR/3sg the magic mountain by Thomas Mann
 'Ivan read 'The Magic Mountain' by Thomas Mann.'
- (34) (NO PREFIX + AORIST = *atelic, bounded*)
 Ivan čete Vulšebnata planina ot Tomas Man.
 Ivan read- AOR/3sg the magic mountain by Thomas Mann
 'Ivan read from 'The Magic Mountain' by Thomas Mann.'
- (35) (PREFIX + IMPERFECT = *telic, unbounded*)
 Ivan pro-čita-še Vulšebnata planina vsyaka godina.
 Ivan PV-read-IMP/3sg the magic mountain every year
 'Ivan read 'The Magic Mountain' completely every year.'
- (36) (NO PREFIX + IMPERFECT = *atelic, unbounded*)
 Ivan čete-še Vulšebnata planina kogato go vidyax.
 Ivan read-IMP/3sg the magic mountain when him (I) saw
 'Ivan was reading 'The Magic Mountain' when I saw him.'

As the examples in (33-36) indicate, there is a clear parallel between telicity and perfective [T] prefixes, the aorist/imperfect tenses and boundedness in Bulgarian. A situation is bounded in time if it has reached a temporal boundary, irrespective of whether the situation has an inherent endpoint or not (Depraetere, 1995). The aorist can be assumed, we propose, to encode the

feature [T] externally to the vP while the imperfect does not. Thus, we relate telicity to the internal [T] feature and boundedness to the external [T] feature. This claim is supported with the fact that, in parallel with the other instance of [T], the aorist aspectual tense also gives rise to strong readings of weak DPs.

The sentence in (37) illustrates the specificity effect of the aorist in Bulgarian. Note that the verb is an activity (imperfective *eat*), the object is a bare plural (*sandwiches*), consequently the VP is atelic. It is only the Aorist tense morpheme that imparts the meaning of specificity to the whole sentence. Compare the sentences in (37) and (38) from Bulgarian. They differ only in their expression of boundedness through the imperfect and aorist morphemes, but their object interpretation is radically different. In (37), the weak object on its strong reading functions as a real argument, and can be referred back to with a pronoun. In (38), the weak object feels like part of the predicate, referring to the activity of “sandwich-eating” (de Hoop, 1995).

(37) External [T]
 Ivan jade sandviči zaštoto gi xaresa mnogo
 Ivan eat-AOR/3sg sandwiches because them liked a lot
 ‘Ivan ate a number of sandwiches because he liked them.’

(38) No External [T]
 Ivan jadeše sandviči kogato go vidjax včera
 Ivan eat-IMP/3sg sandwiches when him I-saw yesterday
 ‘Ivan was eating sandwiches when I saw him yesterday.’

6. THE CONFIGURATIONAL [T]/[T] HYPOTHESIS

We propose that two sets of [T] features, internal [T] and external [T], provide A-quantification. As they are in an asymmetrical relation, external [T] sister contains, in the sense of Chomsky (2000), internal [T]. Internal and external [T] take asymmetric scope over the vP and its arguments.

(39) $[_{TP} \text{ External T } [_{vP} [_{VP} \text{ Internal T }]]]$

Given monotonic ‘bottom-up’ derivations, and the assumption that only positive features are active in core syntax, the configurational [T]/[T] asymmetry hypothesis in (40) has several empirical consequences.

(40) [T]/[T] asymmetry hypothesis

A-quantification, i.e. [T] calculus, and its effect on D-quantification is derived compositionally, given the configurational asymmetry between external [T] and internal [T].

An argument is interpreted as specific in the syntactic derivation i) by feature checking in *v*, given the lexical [T] feature (in achievements) or morphological [T] feature of *v* (in accomplishments), or ii) by feature checking in Tense, given temporal [T] features. One consequence is that if internal [T] is obtained at some point of the derivation, it remains constant throughout the derivation. This follows from the monotonic bottom-up derivation we are assuming for the derivation of phrasal syntax. For example, in Bulgarian, the imperfect tense cannot reverse the specific interpretation of an object that is due to a telicity feature as in (41), even if the whole event becomes durative, comprising an unbounded series of telic sub-events. The chart in (42) includes the four possible combinations and indicates the effect on the object interpretation, specific quantity [SQ].

- (41) *štom napišeše pisma, Marina otivaše da gi pusne na*
 when PV-write-IMP/3sg letters Marina go-IMP/3sg to them mail at poštata
 the post office
 ‘Every time she wrote (specific a number of) letters, Marina went out to mail them at the post office.’

(42) Example	Features	Object Interpretation
Marina kupi kafe Marina buy-AOR/3sg coffee	[External T, Internal T]	[+SQ]
Ivan jade sandviči Ivan eat-AOR/3sg sandwiches	[External T]	[+SQ]
Marina kupuvaše kafe Marina buy-IMP/3sg coffee	[Internal T]	[+SQ]
Ivan jadeše sandviči Ivan eat-IMP/3sg sandwiches	[no T]	[-SQ]

So, the External [T] feature can only be seen to have a quantificational effect on the object interpretation if Internal [T] is not present. In a sense, the

lower feature applies first. If Internal [T] is present, external [T] applies vacuously. This follows from our proposal that, given the monotonic bottom-up derivation, asymmetrically related [T] features determine A-quantification, which itself determines D-quantification.

Furthermore, there are parallel effects of verbal A-quantification on nominal phrases in subject position. Consider the effect of perfective prefixes and lexical perfective predicates in Russian. Note that the sentence in (43) has a stative predicate (*love*) and the sentence in (44) has an activity predicate (*sing*). The interpretation of the subject NP *soldaty* ‘soldiers’ in these examples can go both ways depending on the context. Three different informants stated that the existential indefinite reading is dispreferred but not unavailable when the right context is evoked.

- (43) *soldaty lyubili gruši* [+/-SQ] (Russian)
 soldiers-NOM love-PAST/3pl pears-ACC
 ‘(The) soldiers loved pears.’
- (44) *soldaty peli pesni* [+/-SQ]
 soldiers-NOM sing-PAST/3pl songs-ACC
 ‘The soldiers sang songs.’/‘There were some soldiers who sang songs.’

This is not the case in (45) and (46), however.

- (45) *soldaty s-yeli gruši* [+SQ] (Russian)
 soldiers-NOM PV-eat-PAST/3pl pears-ACC
 ‘The soldiers ate the pears.’
- (46) *soldaty našli den’gi* [+SQ]
 soldiers-NOM find-PAST/3sg money-ACC
 ‘The soldiers found the money.’

The sentence in (45) has an overt perfective prefix, while the one in (46) is an achievement, a lexical telic predicate. The only interpretation available for the subjects in both sentences is ‘a specified by the context set of soldiers’.

Examples from Bulgarian allow us to distinguish between two instances of [T] and indicate that each one of them has the same effect. Recall (cf. Section 2) that Bulgarian bare nouns are variables and obtain their existential or generic interpretation (object vs. kind denotation) through existential or generic operators independently supplied by the sentence logical form (Longobardi, 2001).

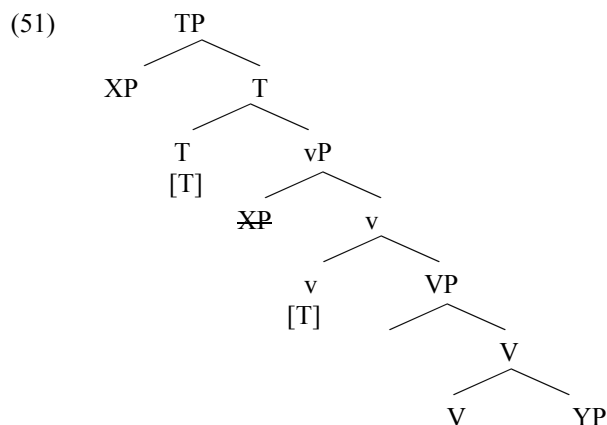
- (47) *telic*
 vojnitzi iz-jadoxa krušite na lozeto (Bulgarian)
 soldiers PV-eat-AOR/3pl pears-DET in the vineyard
 ‘(Some subset of the) soldiers ate the pears in the vineyard.’
- (48) *telic iterative*
 vojnitzi iz-jaždaxa krušite na lozeto vsjaka godina
 soldiers PV-eat-IMP/3pl pears-DET in the vineyard every year
 ‘(Some subset of the) soldiers ate up the pears in the vineyard every year.’

Thus, the presence of the perfective prefix (Internal [T]) contributes to the specific interpretation of the subject, independent of presence or absence of External [T]. On the other hand, in order to tease apart the contribution of External [T], the following Bulgarian examples are relevant.

- (49) vojnitzi pjaxa patriotični pesni i vsički gi slušaxa
 soldiers sing-AOR/3pl patriotic songs and everyone them listened
 ‘Soldiers sang patriotic songs and everyone listened to them.’
- (50) #vojnitzi peexa patriotični pesni i vsički gi slušaxa
 soldiers sing-IMP/3pl patriotic songs and everyone them listened
 ‘Soldiers were singing patriotic songs and everyone listened to them.’

The verbs in the examples above are imperfective, i.e., lacking Internal [T]. The verbal form exhibiting External [T] as in (49), however, can make the subject specific, while the one lacking External [T] as in (50) cannot.

The facts presented above show that in Bulgarian a bare noun subject interpretation ranges over a continuum of meanings from ‘generic’ to ‘specific’, depending on the value of the internal or external [T] feature of the verbal predicate. Together the two sources of A-quantification are argued to take scope over the external and the internal arguments. Thus, the subject also falls under the scope of boundedness and telicity marking. This follows from our analysis, as internal [T] is part of the *vP* domain, which includes the lexical subject (Spec, *vP*) and External [T] is part of the TP domain, which includes the functional subject (Spec, TP). This is illustrated below.



The syntactic representation in (51) is a minimalist representation, in the sense of Chomsky (2001), of the [T]/[T] hypothesis. The configurational [T]/[T] hypothesis follows from Asymmetry Theory, where both syntactic and morphological planes deploy non-isomorphic asymmetric relations, as discussed in Di Sciullo (forthcoming). Thus, in the syntactic derivation there is no Aspect projection, either in the lexical or in the functional domain. Rather, we assume that internal aspectual features are part of the v projection, while external aspectual features are part of the Tense projection. The aspectual [T] feature is part of the feature specification of the functional heads small v and Tense. The features are part of the maximal projections vP and TP including the object, YP, and the subject, XP. Thus the [T]/[T] hypothesis ensures the relation between A-quantification and D-quantification, as the [T] features of v and the [T] features of Tense compositionally derive the aspectual feature structure of TP and has consequences for the specificity feature of the DPs, both object and subject.

7. SUMMARY

D-quantification forms a constituent with a projection of N, while A-quantification forms a constituent with some projection of V. We proposed that the differences and the relations between the structure and interpretation of D- and A-quantification in Romance and Slavic and languages followed from the geometry of the structural descriptions derived by the grammar. We

proposed that A-quantification, [T] calculus, and its effect on D-quantification are obtained compositionally given the configurational asymmetry between external [T] and internal [T].

Our proposal has consequences for the specificity and the interaction of morphological and syntactic derivation. The external/internal configurational asymmetry holds in the derivation of [T] features in morphology and in syntax. We have shown that while the internal prefixes and inflectional heads determine the [T] features in a verbal predicate, and its A-quantification, the checking of internal functional features of *v* and external functional features of Tense, determines D-quantification in phrasal syntax. The specific interpretation of a DP, even in languages such as Slavic where the D is covert, and the telicity of a predicate are determined compositionally given the configurational Internal/External asymmetry.

Previous analyses of the facts have used a syntactic projection AspP, for which there is really no independent evidence. We proposed a system based on a minimal set of features and projections, the [T] features and the configurational asymmetry between external and Internal [T]. We have shown that AspP can be dispensed with and a much more insightful account of telicity, boundedness and specificity can be provided.

NOTES

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1. By asymmetric relations, we mean configurational asymmetries, that is, irreversible relations between two positions in a tree (word/phrase marker). In particular, we focus on the sister contain relation, as defined in Chomsky (2000), which is the core asymmetric relation in the derivation of linguistic expressions, be they morphological

or syntactic. The sister contain relation is defined as follows. In a tree a node sister contains a node iff is included in the sister domain of .

2. The structure building operation Link ensures the merger of grammatical objects into more complex objects, and the operation Shift ensures that relations are established between elements in complex objects. The Economy conditions ensure that locality and legibility hold through the derivations and at the interfaces. See Di Sciullo (forthcoming) for the definitions of the primitives, the operations and the conditions, which are not central to this paper.

3. When English bare plural and mass nouns are in the scope of an overt telicity marker, for example, a telic particle, they behave differently from the Bulgarian ones discussed in the text. They do not take on a strong reading.

- (i) %Miranda ate up sandwiches. *atelic*
- (ii) %Laura wrote up papers. *atelic*

These sentences do not sound acceptable to all native speakers. For the speakers who find them grammatical, they denote a series of iterative, finished events. Both sentences can be continued with the adverbial *one after the other*. This fact suggests that the object cardinality wins out in English telicity marking, and it has scope over the verbal telicity marker. Slabakova (2001a: 90) has used this fact to propose a lower phrase structure position for English particles and a higher position for Bulgarian prefixes. The natural question arises, then, if our proposal in this paper can be extended to English. We are leaving this intriguing question for further research.

4. It is important to keep in mind that it is not prefixes themselves, but prefix senses, or meanings, that are external and internal. For example, the prefix *iz-* in (15) is an internal prefix, while it is an external prefix with a distributive meaning in (16). The verbal root lexically selects which prefixes it can combine with. The verb *četa* ‘read’ takes *pro-* as an internal prefix, while *piša* ‘write’ takes *na-* as an internal prefix. Almost all prefixes have one internal meaning (telicity marking) and more than one external senses. The challenge for learners of Bulgarian, then, is the lexical acquisition of all the meanings of the 19 perfective prefixes, together with the verbs’ selectional properties.

5. Arguing for an essentially similar analysis, Filip (to appear) shows that Czech prefixed verbs differ in their quantizing properties depending on the spatial orientation of the prefixes they contain: Only Goal-oriented prefixes (e.g., *při-* ‘to’) but not Source-oriented ones (e.g., *od-* ‘away, from’) yield quantized verbs. In the examples in (i), we have a measure expression ‘one meter’ which acts as a quantizing modifier, applying to homogeneous predicates and turning them into quantized predicates. In the case of (i-b)

this is impossible, because the predicate is already quantized. In the case of (ii-b), the attenuative prefix *po-* acts as the measure expression, demonstrating similar effects.

- (i) a. *Od-sedl si asi metr od okna.*
 away-sat.down refl about meter from window
 ‘He sat down about a meter away from the window.’
 b. **Při-sedl si asi metr k oknu.*
 to-sat.down refl about meter to window
 ‘He sat down about a meter away from the window.’
- (ii) a. *Po-vy-táhl káru z příkopu.*
 att-out-pull cart from ditch
 ‘He pulled the cart partly out of the/a ditch.’
 b. **Po-do-táhl káru k/do příkopu.*
 att-to-pull cart (in)to ditch
 ‘He pulled the cart partly into the/a ditch.’

Since examples (i-b) and (ii-b), ungrammatical in Czech, are perfectly fine in Bulgarian, we conclude that differences may exist among Slavic languages in the exact form the quantizing contribution of perfective prefixes takes, and we leave the matter to further research on perfectivity and cross-linguistic variation. It is important to notice, however, that much evidence converges against the traditional view that Slavic perfective prefixes are a homogeneous group.

6. The sheme based on the [T] and the [S] features pertains to lexical aspect. Phrasal syntax may affect these lexical features as discussed below.

7. A reviewer asks about verbs like *pod-kupit* ‘bribe’, *o-kupit* ‘compensate’, *ot-dat* ‘return’, *iz-dat* ‘publish’, which are composed of the achievement roots *kupit* ‘buy’ and *dat* ‘give’ with internal prefixes. It is true that some of the prefixes in the examples above may function as internal when attached to other, activity roots, but note that in the above verbs, they change the lexical meaning of the root quite considerably. Russian, and all Slavic, perfective prefixation is a derivational process, so the creation of these telic verbs based on telic roots is not surprising: it is lexically driven. In our system, the prefixes *pod-*, *o-*, *ot-* and *iz-* in the above examples do not function as internal, telicizing, prefixes but just as derivational morphemes.

Furthermore, Slabakova (2001b) demonstrates experimentally that the restriction that telic verbs cannot be further telicized, reflecting the same prediction (cf. also Tenny, 1994), is part of the mental grammar of Bulgarian native speakers.

8. An anonymous reviewer suggests that, given our analysis, every object of the lexical root *da-* ‘give’ will have a specific reading, in other words, no object of Bulgarian *give* can ever appear with an unspecified cardinality interpretation. This is, of course, contrary to fact, since the language has to be able to express this particular meaning.

The verbal form that supports the unspecified cardinality interpretation is the secondary imperfective form *da-va-m*, as in (i) below:

- (i) nie da-va-me podaræci na decata za nova godina
 we give-PRES/1pl presents to the children for new year
 ‘We give presents to the children for the New Year.’

It seems to be the case that (only) the secondary imperfective morpheme *-va-* is capable of overcoming the lexical telicity feature of the root *da-*. This happens at the level of the VP, lower than the second instantiation of the [T] feature. Thus, the main thrust of the asymmetric [T]/[T] hypothesis we argue for in this paper is not diminished. We are grateful to the reviewer for bringing this point up, and will take up this issue in further research.

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