Integrating Telicity, Aspect and NP Semantics:
The Role of Thematic Structure

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0 Introduction

Slavic languages have a rich inventory of verb affixes that typically have syntactic and semantic effects on the argument structure of the derived verb. Although verb affixes function as operators on verbs, they often restrict the interpretation of certain nominal arguments in a way in which determiners in a nominal construction do. This intriguing fact has not been systematically described in the relevant literature. I propose that verb predicate operators that determine the aspect (perfective and imperfective) of verb predicates also function as "lexical" quantifiers (in the sense of Partee, 1990) over episodic predicates and their arguments. In particular, they bind the variable introduced by the Incremental Theme NP providing it with a quantificational force and/or closely related notions, such as boundedness and definiteness.

The hypothesis, which is supported by the linguistic evidence from Czech, draws on Krifka's programmatic proposal (1986, 1989 and 1992) and the notion 'Incremental Theme' introduced by Dowty (1988, 1991), who in turn follows some proposals in Hinrichs (1985) and Krifka (1986, 1989). The Incremental Theme is one of the contributing properties of the Proto-Patient role. It is characterized by its association with the argument that influences the telic or atelic interpretation of a given complex verb predicate.

My findings contribute not only to the reservoir of facts that suggests that thematic roles are required in the statement of linguistic generalizations, but also they are directly related to the research on quantification and semantic typology initiated by Partee, Bach and Kratzer (1987). They propose that the variety of means by which quantification is expressed in natural languages, can be divided into two main morphosyntactic classes: D-quantification and A-quantification. This distinction can be approximately described as a

distinction between quantification expressed by determiners within NPs, and quantification expressed by various non-NP means at the level of a verb, a VP or a sentence. The class of A-quantifiers includes adverbs of quantification, auxiliaries, affixes, for example.

1 The Czech data

1. 1 Definiteness and boundedness

The best examples for the influence of verb morphology on the semantic properties of nominal arguments can be found in sentences that contain undetermined mass and plural NPs that function as DOs, as is shown in (1):

(1) a.   (1) b.

Pil^I *víno.*   *Vypil*^{P} *víno.*
drank-SG   wine-SG-ACC   PREF-drank-SG   wine-SG-ACC
'He was drinking (the) wine.'   'He drank up (all) the wine.'

(1a) and (1b) contain the same undetermined mass DO-NP *víno* 'wine'. Formally, these two sentences only differ in aspect, marked on their main verbs. Nevertheless, there is a significant difference in the interpretation of their DO-NPs.

(1b) with the prefixed perfective verb *vypil*^{P} entails that the event ended when the Agent finished drinking all the wine. The speaker presupposes that the hearer can identify the relevant portion of wine in the discourse. In this most natural, single event, interpretation, *víno* 'wine' is *bounded*, *referentially specific* (or *definite*) and *universally quantified*. This interpretation is often associated with the referential use of definite descriptions in languages like English. This observation is significant in the light of the fact that Czech, like most Slavic languages, has no overt article system.

By contrast, (1a) with the imperfective verb *pil*^{I} suggests that there was an *unbounded* amount of wine. The unbounded meaning is enhanced if imperfective sentence (1a) is used progressively. The use of the mass DO-NP *víno* 'wine' here most closely corresponds to English undetermined mass NPs or mass NPs with the unstressed partitive determiner 'some'.

A similar interaction also takes place between aspectual operators and undetermined plural DO-NPs, as is shown in (2a) and (2b):

(2) a.

Jedl[I] *ořechy.*
ate-SG   nuts-PL-ACC
'He was eating (the) nuts.'

(2) b.

Snědl[P]   *ořechy.*
PREF-ate-SG   nuts-PL-ACC
'He ate (all) the nuts.'

To summarize, the above examples show that the quantificational and definiteness interpretation of undetermined mass NPs must be the effect of verb aspect, since the above pairs of sentences minimally differ in aspect marked on the verbs, there are no other expressions in the environment of the undetermined mass NPs that could be responsible for this interpretation and undetermined mass NPs on their own are standardly considered to be unbounded.

Although the correlation between perfective aspect with the definite and universal interpretation of the DO-NP is well-known in Slavic linguistics[1], it has not been systematically investigated. In particular, the problem is to account for those cases in which the perfective aspect **must** be correlated with nominal arguments that are interpreted as bounded, referentially specific (definite) and universally quantified (as in (1b) and (2b)), and *also* for those cases in which it **need not** or even **must not**. The last case is illustrated in the following pair of sentences, in which the difference in aspect is not necessarily correlated with a different interpretation of DO-NPs. Crucially, the DO-NP in perfective sentence (3b) does not have a referentially specific and universally quantified interpretation:

(3) a. *Slyšel*[I]   *hlasy*   *na chodbě.*
       heard-SG   voices-PL-ACC   on corridor
       'He heard (some) voices in the corridor.'

(3) b. *Uslyšel*^{P} *hlasy*   *na chodbě*.
      PREF-heard-SG   voices-PL-ACC   on corridor
      'He (suddenly) heard (some) voices in the corridor.'

1. 2 Quantification

In the previous section, it was observed that verb predicate operators have semantic effects that are comparable to those of articles and to the quantifiers 'all' or 'whole' (universal) and 'some' (partitive). In addition, verb predicate operators may have effects that are comparable to other quantifiers, both strong and weak (cf. Barwise and Cooper 1981), and various expressions of measure and quantity. Two well-known cases are illustrated by (4) and (5).

(4) *Napil*^{P} *se*   *kávy*.
      PREF-drank-3SG   REFL   coffee-SG-GEN
      'He drank some coffee.'

The prefix *na-* in (4) *napit*^{P} *se kávy* 'drink some coffee' functions as a vague quantifier with respect to the object 'coffee', meaning approximately 'the set of groups with at least *n* members each, where *n* qualifies as a large number by some contextually relevant standard'. In other words, the contribution of the prefix *na-* is close to the meaning of the English vague quantifiers 'many', 'much', 'a lot (of)'.

In (5) the prefix *po-* is responsible for the distributive reading that concerns the subject argument:

(5) *Šálky*   *se*   *porozbíjely*^{P} *v myčce*.
      cups-PL-NOM   REFL   PREF-broke-PL   in dishwasher
      '(All) the cups broke in the dishwasher.' [one by one]

Quantificational phenomena comparable to those illustrated by the examples in this section have only recently been noticed and described in some non-Indo-European languages (cf. Partee, Bach, Kratzer, 1987, Partee, 1990). However, Slavic derivational verb affixes have not been studied from the point of view of the current theory of quantification. Yet the idea that derivational verb affixes convey various quantificational and closely related notions is certainly implicit in

the copious literature on 'Aktionsarten' (German for 'manners of action'), in the sense used in the traditional Germanic and Slavic linguistics (cf. Agrell, 1908 and Isačenko, 1962, for example) with reference to the categorization of the semantic contribution of individual verb affixes to the meaning of derived verbs. The vast number of studies on Aktionsart classes in this narrow mophological sense is a virtual trove of invaluable observations that implicitly confirm the existence of such effects (for the Czech data, see, for example, Petr 1986).

2 Previous approaches

2. 1 D-quantification and A-quantification

The observation that verb predicate operators seem to function as determiners and various expressions of quantity and measure with respect to nominal arguments is by no means unique to Czech and other Slavic languages. Similar observations have been made in such typologically distinct languages as Japanese (Takashi, p.c.), Hindi (Singh 1991), Eskimo (Bittner 1991), American Indian languages (cf. Jelinek 1988), Warlpiri and Gun-djeyhmi (cf. Partee 1990:16-17), to give just a few examples.

Recent research on quantification initiated by Partee, Bach and Kratzer (cf. Partee, Bach and Kratzer 1987; Partee 1990, and others) has opened new fruitful venues for the investigation of this phenomenon. They assume that NP quantification is not universal. Quantificational phenomena in natural languages can be divided into two main syntactic and semantic classes: *D-quantification*, which is typically expressed in the NP with determiner quantifiers, and *A-quantification* expressed at the level of the sentence or VP with sentence adverbs (*usually, always*), "floated" quantifiers (*each*), auxiliaries, affixes, "argument-structure adjusters", for example. D- and A-quantifiers with the same quantificational force differ in that the D-quantifier counts individuals, whereas the corresponding A-quantifier counts "cases" (Lewis 1975).

Partee (1990) illustrates the influence of verb morphology on nominal arguments with the Czech prefix *po-*, as in *pomalovat* 'to

paint all over X', 'to cover X with paint':

(6) *Pomaloval*^{P} *stěnu*   *(hesly)*.
     PREF-painted-SG   wall-SG-ACC   (slogans-PL-INSTR)
     'He covered the wall (with slogans).'

The prefix *po-* has here a completive meaning that is "in a certain sense quantificational but is certainly to be captured at a lexical rather than a syntactic level" (Partee 1990:19). Another example of this type of "quantificational mechanism" is Warlpiri example (7) with the partitive preverb *puta-*:

(7) *Ngapa*   *o-ju*   *puta-nga-nja*.
     water   AUX-1sg   PART-drink-IMP
     'Just drink some (not all) of my water!'

Any attempt at describing the influence of verb morphology on nominal arguments should address the following two issues:

The first concerns the conditions under which a given verb predicate operator extends its semantic effects over a particular nominal argument or arguments.

The second concerns the non-compositional nature of the data (in particular, in such examples as (2), (4) - (6)). They challenge the hypothesis that the meaning of sentences can be derived in a systematic way by appplying compositional semantic rules to independently motivated syntactic structures.

In what follows I will focus on the partitive-holistic, bounded-unbounded, definite-indefinite interpretation of nominal arguments that is determined by verb aspect.

2. 2 Krifka

2. 2. 1 Lattice theory and thematic roles

Krifka (1986, 1989 and 1992) proposes that the influence of verb aspect on the interpretation of nominal arguments depends on the lexical semantics of a certain classes of verb predicates[2]. He proposes that the relevant predicates denote events that stand in a one-to-one relation to one of their participants or objects[3]. The relevant object undergoes a

gradual change of state in distinguishable consecutive stages and its extent its intrinsically tied to the extent of the event.

To illustrate this point, take the following example. When we drink a glass of wine, the quantity of wine in a glass gradually decreases in lockstep with the progress of the drinking event. The incremental change in the quantity of wine allows us to monitor the progress of the drinking event. When the glass becomes empty, the drinking event necessarily comes to an end. In short, the decreasing quantity of wine in a glass is intrinsically tied to the delimitation of the drinking event.

Krifka (1986, 1989 and 1992) formally represents this observation within an event semantics that is enriched with *lattice* structures. He assumes that the domains of objects and events constitute two non-overlapping sorts of entities, each of which has the structure of a complete join semi-lattice[4].

For example, a NP like *a glass of wine* denotes a quantity of wine that has various proper parts which are quantities of wine of various sizes, none of which, however, is itself the main quantity denoted by *a glass of wine*. On Krifka's view, the part structure of the quantity of wine is modeled as a lattice of objects. Similarly, an event denoted by the VP *drink a glass of wine* has a part structure modeled as a lattice of subevents, none of these is itself an event that is described by the same VP *drink a glass of wine*. The intuition that we can correlate the part structure of a glass of wine with the part structure of the event of drinking that glass of wine in a one-to-one fashion is represented by means of a homomorphic mapping between the two respective lattices[5].

Building on the independently motivated assumption that thematic roles are relations between objects and events, Krifka introduces a new thematic role, **Gradual Patient**, for objects that stand in a one-to-one relation to events (e.g., objects denoted by NPs like *a glass of wine* in *drink a glass of wine*). This amounts to the claim that a part of the meaning of verbs like *drink* is modelled by means of a homomorphism between algebraically structured denotations of the Gradual Patient argument and the event. The single most important properties of the

Gradual Patient that mediate between event and object are: the mapping-to-events ("MAP-E") and mapping-to-objects ("MAP-O"). The former says that every part of the glass of wine being drunk corresponds to a part of the drinking event. The latter says that every part of a drinking of a glass of wine corresponds to a part of the glass of wine.

The homomorphism hypothesis motivates not only the influence of verb predicates on the interpretation of nominal arguments in Czech and Polish (cf. Krifka 1986, 1989 and 1992), but also the converse case, which is far more well-known, namely, the influence of nominal arguments on the telic (bounded) and atelic (unbounded) interpretation of VPs and sentences[6], as is shown in (8):

(8) a. *Mary drank a glass of wine*.   telic
(8) b. *Mary drank wine*.   atelic

Given that *drink* is a homomorphic predicate, in (8a) it maps the denotation of its Gradual Patient argument, *a glass of wine*, into the event of drinking a glass of wine. Since *a glass of wine* denotes a bounded entity, the VP *drink a glass of wine* denotes a bounded event, as well. Similarly in (8b), the mass NP *wine* gives rise to the unbounded interpretation of the VP *drank wine* (cf. Krifka 1986, 1989 and 1992)

Krifka's Gradual Patient role was adopted by Dowty (1989, 1991) under the label 'Incremental Theme'. I will use Dowty's term, because it is widely accepted in the current research on thematic roles and argument selection. Examples of verbs that take the Incremental Theme argument are (cf. Dowty 1991:568ff.): *build a house*, *write a book*, *knit a pullover*, *destroy a presidential finding*, *eat a sandwich*, *paint a house*, *polish a shoe*, *proofread an article*, *play a sonata*; *copy a file*, *read a book, memorize a poem*; *enter, exit, reach, leave, depart, abut, abandon*; *melt, emerge, submerge, deflate, bloom, vaporize, decompose*[7].

2. 2. 2 Aspect, telicity and NP semantics

In order to motivate the influence of verb predicates on the interpretation of nominal arguments in Czech and Polish (Krifka 1986, 1989 and 1992), Krifka makes two further assumptions in addition to

the notion of 'Gradual Patient' (Dowty's 'Incremental Theme') and the formal apparatus within which it is embedded:

(i) Undetermined NPs in Czech are ambiguous between a definite and an indefinite interpretation. This is captured by a syntactic rule 'NP → N' that is associated with two semantic interpretations, a definite and an indefinite one. For example, the Czech undetermined mass NP *víno* is ambiguous between 'wine' or 'the wine'. In the definite reading, *víno* is bounded, while in the indefinite reading, it is unbounded. Singular count NPs like *hru$\overset{v}{s}$ka* mean 'a pear' or 'the pear' and they are bounded in both the definite and indefinite reading.

(ii) The perfective operator can only be applied to a bounded verb predicate, while the imperfective operator to an unbounded one (cf. Krifka 1989:187; 1992:50). In other words, perfective expressions are telic and imperfective expressions are atelic.

Krifka's explanation for the definite interpretation of undetermined NPs with mass nouns in perfective sentences, such as (1b), is as follows: The perfective aspect "forces" a bounded, or telic, interpretation of the complex verb predicate (cf. (ii)). Given the homomorphism hypothesis, the verb predicate "forces" a bounded interpretation of the NP associated with the Incremental Theme (cf. Krifka 1992:50). Since undetermined NPs with mass nouns in Czech are by definition bounded only if they also have a definite interpretation (cf. (i)), undetermined NPs with mass nouns in perfective sentences, such as (1b), are definite.

Two main objections can be raised against Krifka's compositional account. First, the assumption that undetermined NPs in Czech are ambiguous between a definite and an indefinite interpretation lacks empirical motivation. Second, Krifka's account is problematic, because it presupposes the following equations: telic = perfective and atelic = imperfective.

Despite its problems, Krifka's is the most promising analysis of the influence of aspect on nominal arguments in Slavic languages to date. Building on Krifka's proposal, I will outline an alternative analysis of the Czech data that avoids the two problems that weaken Krifka's account.

In what follows I will show, among other things, how my account differs from Krifka's. First, I draw a clear line between telicity and aspect. The categories of telicity and aspect are characterized in terms of part-whole relations, and related concepts like boundedness, that are grounded in the theory of mereology. Second, the definite/indefinite distinction is orthogonal to the bounded/unbounded distinction. Third, undetermined NPs in Slavic languages, and in other languages that lack an overt article system, are not ambiguous between the definite and indefinite interpretation. In such languages the (in)definiteness category does not belong to the system of grammatical categories, but rather the definite and indefinite readings arise as a result of the interaction of a number of lexical and grammatical categories and pragmatic principles of interpretation. That is, all occurrences of undetermined mass and plural NPs are alike in terms of syntactic structure and semantic interpretation.

3 Suggested analysis

3. 1 General approach

(9)   Hypothesis: Verb predicate operators function as quantifiers whose scope extends over episodic predicates and their arguments. They bind the variable introduced by the Incremental Theme NP and provide it with quantificational force and related meanings.

Such predicate operators typically function as "argument-structure adjusters" (cf. Partee 1990), as they have syntactic and semantic effects on the argument structure of predicates to which they are applied. One of their salient properties in Slavic languages, in particular, is to induce aspect (perfective and imperfective) shifts.

Corollary 1: In the scope of a perfective operator, the variable associated with the Incremental Theme NP has a universal quantificational force, meaning approximately 'all (of a whole) x'. In the scope of an imperfective operator, the variable associated with the Incremental Theme NP has a partitive force, meaning approximately 'part of x'.

Corollary 2: Verb operators with idiosyncratic lexical meanings often incorporate various kinds of quantificational meanings (e.g., distributivity, vague quantificational meaning 'many', 'much', 'a lot (of)') and closely notions, which also constrain the interpretation of the variable introduced by the Incremental Theme NP.

The description of the influence of verb aspect on the interpretation of nominal arguments proposed here exploits the following information encoded in the lexicon:

1. thematic structure of verbs;

2. lattice-theoretic representation of objects and events;

3. semantic characterization of telicity and aspect (perfective-imperfective);

4. inherent lexical semantic properties of nouns, in particular their subcategorization on the basis of the distinctions 'count/mass', 'singular/plural' and 'bounded/unbounded'.

This information is independently motivated and needed elsewhere in grammar. As in many current approaches to syntax[8], I assume that much of the information about the combinatorial properties of words is encoded in the lexicon. Complex lexical information can be represented as a taxonomic system of lexical types. It is organized on the basis of a small number of word types in cross-cutting hierarchies that classify all the words on the basis of shared syntactic, morphological, semantic and pragmatic properties. The shared types of lexical information are stated only once in a single place in the lexicon. This has the advantage that the amount of idiosyncratic information stipulated in individual lexical entries is significantly reduced, because we can factor out from the individual lexical entries those properties that can be predicted from their membership in lexical types.

3. 2 Characterization of telicity and aspect

3. 2. 1 Telicity vs. aspect

Examples like (10) in which telicity and aspect interact best illustrate the claim that we need to draw a clear line between these two categories:

(10) *Psal^I dopis.*
    wrote-SG   letter-SG-ACC [9]
    'He was writing a/the letter.'

The telic (or bounded) predicate *psát^I dopis* 'write a/the letter' in (10) describes a situation that involves a final state at which the whole letter exists (result state). Following Krifka's and Dowty's proposal, the telic nature of the predicate 'write a/the letter' is motivated by the assumption that 'write' entails a homomorphism and the NP associated with its Incremental Theme, 'a/the letter', is bounded.

If the imperfective operator were only applicable to atelic (or unbounded) verb predicates, as Krifka assumes[10], then *psát^I dopis* 'write a/the letter' in (10) would have to be atelic. Since the NP 'letter' is count (or bounded), this would contradict Krifka's and Dowty's claim that bounded NPs associated with the Incremental Theme give rise to the telic interpretation of verb predicates. To avoid this contradiction, we could assume that singular count NPs (and bounded NPs in general) that are linked to the Incremental Theme undergo a 'count-to-mass' (or 'bounded-to-unbounded') shift in the scope of the imperfective operator. Clearly, this would be counterintuitive and undesirable. Furthermore, imperfective sentences like (10) can be used not only to convey incomplete events, but also, due to their unmarked nature, completed events, that is, they can be used with the completive meaning carried by aspectually marked perfective sentences. All of this suggests that we need to abandon the claim that the imperfective operator is only applicable to atelic verb predicates.

What we have in (10) is, of course, a manifestation of the well-known 'imperfective paradox' (cf. Dowty 1972, 1977, 1979) or 'imperfective puzzle' (cf. Bach 1986)[11]. A *sine qua non* of any adequate aspect theory is to account for this paradox or puzzle. It can be summarized in the following question: A given situation is part of a telic (bounded) event type. How can we desribe its truth conditions if there never was, is, or will be the corresponding whole telic event that the situation is part of? The statement of truth conditions is further complicated if the situation involves an object that comes into existence throughout its course. That is, sentences like 'John was writing a/the letter' entail no existential quantification over 'a/the letter', and such

sentences can be felicitously uttered even if there never was, is, or will ever the whole letter. Since Dowty (1972, 1979) various intensional accounts have been proposed to account for the progressive construction in English and other languages. Krifka's purely extensional account that presupposes a 'one-component' theory of aspect (i.e. telic=perfective and atelic=imperfective) cannot do justice to all the complexities of the progressive.

2. 2. 2 Telicity

The telic/atelic distinction is often elucidated in terms of part-whole relations, and such notions as boundedness, and by drawing structural parallels to the spatial domain of objects (cf. Talmy 1978; Talmy 1986; Bach 1986; and many others). Examples are given in the following table:

TABLE 1

unbounded	bounded
UNDETERMINED PLURAL AND MASS NP	SINGULAR COUNT NP
apples	*an/the/one apple*
wine	*a glass of wine*
ATELIC	TELIC
Mary drank wine	*Mary drank a glass of wine*
Mary was in New York	*Mary arrived*

Such structural parallels are taken to reflect the parallels in the cognitive structuring of space and time (cf. Talmy 1978; Talmy 1986).

It has often been observed[12] that there is an affinity between the properties of situations that have their counterparts in the spatial domain of objects, on the one hand, and the mereological predicate logic, on the other hand. Mereology (or the logic of part-whole relations) is based on a binary 'part' relation and a single operation of forming a new individual out of several individuals. It provides a

unified account of mass NPs, singular and plural count NPs and of certain properties of verbal expressions. According to Bach (1981:70), telic situations "are antisubdivisible and nonadditive", while atelic situations "lack these properties". Telic situations like an arriving are *antisubdivisible* (cf. Bach 1981:70), for it holds that "no proper part of one event can be an event of the same kind" (Bach 1981:70). Similarly, bounded entities denoted by such NPs as *an apple, five apples, a glass of wine* are antisubdivisible. This property is not shared by atelic situations and unbounded entities. Two or more atelic situations, or unbounded entities, of the same kind add up to one atelic situation, or to one unbounded entity, of the same kind. Bach (1981:70) calls this property *additivity*. The sum of two distinct telic situations, or bounded entities, of the same kind is never a situation, or bounded entity, of the same kind.

3. 2. 3 Characterization of Slavic aspect

As Bach (1986) proposed, mereological part-whole relations can also serve as the basis for the characterization of aspect. The characterization of telicity and aspect in terms of the same mereologically-based concepts has the advantage that it allows us to motivate their interaction in a straightforward way. Moreover, it allows us to incorporate aspect, in the sense of perfective-imperfective distinction, into Krifka's lattice-theoretic framework.

3. 2. 3. 1 Imperfective aspect

Leaving aside its habitual and iterative uses, the imperfective aspect has two main contextually determined uses: **progressive** and **non-progressive** (cf. Comrie 1976; Timberlake 1982, 1985).

Following Bennett and Partee (1972) and later researchers on aspect, in particular Bach (1986), I assume that the characterization of progressivity involves the notion of partitivity. Within an event semantics that draws on the theory of mereology, Bach (1986) extends Link's (1983) lattice analysis of mass and plural NPs to the denotata of VPs and sentences. Following Bach's (1986) mereologically-based account, the meaning of the progressive aspect (or the progressive use of the

imperfective) can be captured in terms of a *proper part* relation: the progressive *requires* that the denoted situation *not* be viewed *in its entirety.*

In its progressive use, Slavic imperfective aspect overlaps with the English progressive. Consider a sentence like (11):

(11) *Psal^I dopis.*
     wrote-SG   letter-SG-ACC
     'He was writing a/the letter.'

The Slavic imperfective aspect is the unmarked member in the aspectual distinction, that is, sentences with imperfective verbs can be also used if the speaker intends to convey the fact that a certain event took place "without any implication of progressive or habitual meaning" (Comrie 1976:113)[13]. In this non-progressive or durative (Timberlake 1982, 1985) reading, (11) can be felicitously used in a situation in which it is understood by the interlocutors that the writing event was completed. However, the explicit encoding of this fact by means of the corresponding perfective verb *napsal^P* is avoided, because it is considered irrelevant for the communicative purposes.

In sum, the usage range of the imperfective aspect not only comprises progressivity, but it also covers what is typically conveyed by the perfective aspect[14]. The imperfective aspect, including both its progressive and non-progressive use, can be then characterized in terms of a *part-of* relation. The 'part-of' relation is to be understood as 'not necessarily proper part of', as the Slavic imperfective *allows for* the denoted situation not to be viewed in its entirety.

> (12) The imperfective operator has a **partitive** function with respect to the situation denoted by a verb predicate in its scope. We need to distinguish two cases:
>
> (i) a 'part-of' relation is understood as 'not necessarily proper part of', it *allows for* the denoted situation not to be viewed in its entirety. (Example: the Slavic imperfective.)
>
> (ii) a 'part-of' relation is understood as 'a proper part of', it *requires* that the denoted situation not be viewed in its entirety. (Example: the English progressive.)

3. 2. 3. 2 Perfective aspect

Perfective verbs are bounded (or telic).   According to the type of boundary lexicalized by perfective verbs, we may divide perfective verbs into three main classes.

A. Perfective verbs that focus on the tail end or (the crossing of) the **final boundary** of a full-fledged situation, as the prefix *do-* in *dopsat*[P] *dopis* 'to finish writing a/the letter'.

B. Perfective verbs that encode the beginning of a situation (inchoatives) in particular, if they are derived from imperfective verbs denoting atelic states and processes. In *rozesmát*[P] *se* 'to start laughing', 'to burst out laughing', the prefix *roz-* and the verb root denote an event that comprises the **initial boundary** and phase of a situation which itself can be denoted by the atelic imperfective verb *smát*[I] *se*[15].

These two classes suggest that in describing the semantics of perfectivity a distinction must be drawn between a situation leading up to its inherent culmination phase or final boundary and a situation leading up to the beginning of another situation[16].

C. Perfective verbs that are derived with affixes that have a function comparable to measure expressions in the nominal domain. For instance, the prefix *za-* in *zaplavat*[P] *si* 'to have a [relatively short] swim' extracts a portion of the situation denoted by the simple imperfective verb *plavat*[I] 'to swim'. In addition, it also provides a quantitative evaluation of the temporal duration of a situation. We may dub this the **bilateral delimitation** of a situation or a *portion-extracting* function (cf. Talmy 1986).

The characterization of perfectivity in terms of the notion of a boundary has a long tradition in Slavic linguistics[17]. It ties in with another traditional characterization of perfectivity as indicating "the view of a situation as a single whole", as Comrie (1976:16) puts it[18]. The connection is easy to see. By encoding the final-boundary of a situation, perfective verbs evoke the rest of the situation. With perfective verbs that encode the initial boundary of a situation, we find that the culmination phase/final boundary of a situation S_1 that leads up to the beginning of a situation S_2 is identical with the initial

phase/boundary of S_2. Hence, in the case of inchoative perfective verbs, the situation viewed 'as a single whole' is the situation at the intersection of S_1 and S_2. If a perfective verb indicates that a situation took place within certain temporal boundaries, within a certain 'measure of time', all parts of a situation are presented as a single whole. Following mainly Comrie (1976), I propose the following characterization of the perfective operator:

> (13) The perfective operator has a **holistic** function with respect to the situation denoted by a verb predicate in its scope.

3. 3 The perfective aspect and undetermined mass and plural DO-NPs

3. 3. 1 The perfective operator and Incremental Theme

Let us go back to (1b). The prefix *vy-* serves here to derive the perfective verb *vypil*[P]: with the meaning 'to drink completely', 'to finish drinking' or 'to drink up'. At the same time, the perfective aspect can be viewed as a kind of universal quantifier with respect to the variable introduced by the Incremental Theme NP 'wine'. Notice that we cannot assert without contradiction:

(14) **Vypil*[P] *víno z této sklenky$_i$, ale trochu vína v ní$_i$ ještě je.*
    *'He drank up the wine from this glass$_i$, and yet there still is some wine in it$_i$.'

This strongly suggests that the perfective operator takes scope over both the verb and Incremental Theme argument. If "HOL" stands for the holistic meaning associated with the perfective operator, we can roughly represent this situation as: HOL-V + Incremental.Theme = HOL(V + Incremental.Theme)

3. 3. 2 Holistic meaning and boundedness

In general, if a situation (or an object) is viewed in its entirety, there must be some limits imposed on its temporal (or spatial) extent, it must be bounded. In short, 'all of a whole (entity)' requires a 'whole (entity)'. In the domain of the denotation of verbal predicates this

amounts to the claim that perfective predicates are telic (or bounded).

3. 3. 3 Homomorphism

The observation that a perfective operator functions as a modifier of the NP *víno* 'wine' can be explained, if we assume that *vypít*[P] 'to drink up' is a homomorphic predicate mapping the described event and its subevents into some quantity of wine and its subparts. Consequently, if the perfective verb has a holistic, and hence bounded interpretation, the Incremental Theme 'wine' must have a holistic and bounded interpretation, as well.

Notice that in a Czech perfective construction with an undetermined mass or plural NP linked to the Incremental Theme, the main lexical verb alone carries both the information about aspect and telicity. The verb alone determines the perfective interpretation of the sentence and the quantificational interpretation of the Incremental Theme argument.

3. 3. 4 The correlation of bounded and definite interpretation

It is *not* the perfective aspect itself that requires that undetermined mass and plural NPs linked to the Incremental Theme be definite (cf. also Krifka, 1992). Rather the perfective aspect only requires that they have a universal, 'all (of a whole) entity' interpretation. The 'all (of a whole) entity' interpretation in turn presupposes the existence of 'a whole *bounded* entity'.

Just in case the Incremental Theme NP in the scope of a perfective aspect is an undetermined plural or mass NP, the assignment of the universal or totality 'all'/'whole' interpretation presupposes that there is some contextually identifiable bounded referent that is asserted to be completely subjected to the denoted event. Such a contextually identifiable bounded referent will typically be high on an individuation and a definiteness scale (but see comments on the contribution of the prefix *na-* in section 3.3.6). This ultimately motivates the correlation 'perfective aspect - definite Incremental Theme NP', provided the Incremental Theme NP is undetermined and unbounded.

The contextually determined bounded or count use of mass nouns may correspond to a 'portion' of the stuff denoted by them. This interpretation is licensed if the speaker assumes that the hearer can identify the relevant portion on the basis of the sentence-internal context, the external context of the utterance or the discourse-level linguistic context. The verb *drink* evokes the general knowledge that beverages are usually packaged, served and consumed in containers--glasses, cups, mugs, pots, bottles--which have a certain standard or conventional size. For example, the count use of the mass noun 'wine' in (1b) can be replaced by 'glass of wine', an individuator term indicating the relevant portion (a kind of classifier) and a mass use of the noun.

The speaker who utters a sentence like (1b) may presuppose that the hearer can *uniquely identify* a *specific* portion of wine in the discourse. The definiteness or referential specificity in this highest degree, however, is not always required. It is sufficient that the referent of *víno* 'wine' in (1b) is a member of a certain identifiable set (cf. Comrie 1981:128): it is the set of portions determined by conventional containers in which wine is served. The speaker may presuppose that the hearer knows that the referent is some individuated entity or other in this set.

With plural nouns the contextually determined bounded sense may not always be obvious. The reason is perhaps that we do not always have an appropriate "classifier" or individuator term that would provide us with a conventional way of referring to groups of books, houses, applications, etc. If a perfective sentence requires that its undetermined plural NP is bounded, because it is associated with the Incremental Theme, and if the requisite bounded sense is not readily identifiable, the whole sentence may sound odd. This oddity is avoided, if the plural noun in question occurs in a construction with a determiner, a prepositional phrase and/or a relative clause that explicitly restrict its domain of reference to a bounded set of individuals. In the following examples, "#" indicates 'acceptable, but not preferred or frequent':

(15) a. *Postavil*^P *#domy / dva domy.*
'He built houses / two houses.'

(15) b. *Napsal*^P *#knížky / několik knížek pro děti.*
'He wrote books / several books for children.'

(15) c. *Napsal*^P *#žádosti / hodně žádostí.*
'He wrote applications / a lot of applications.'

3. 3. 5. 1 The obligatory occurrence of the definite article

The claim that the perfective aspect is correlated with the bounded and definite Incremental Theme argument can be supported with the data from Bulgarian. In Bulgarian, the use of the enclitic definite article *-to* is in such cases obligatory, as is shown in (16):

(16) *Toj   izpi*^P   **kafe   /   kafeto.*
    he-NOM   PREF-drank-SG   *coffee-ACC   /   coffee-DF-ACC
    'He drank up (all) the coffee.'

Similarly, in a comparable English construction with the resultative verb *to drink up* the definite article is required. Compare *He drank up *wine* vs. *He drank up the wine*.

3. 3. 5. 2 Nominal arguments that are not linked to the Incremental Theme role

The hypothesis (9) correctly predicts that 'voices' in (17) does not have a universal and definite interpretation. (17) cannot mean 'He (suddenly/unexpectedly) heard all the voices in the corridor.'

(17) *Uslyšel*^P   *na chodbě   hlasy.*
    PREF-heard-SG   on corridor   voices-PL-ACC
    'He (suddenly/unexpectedly) heard (some) voices in the corridor.'

The prefix *u-* serves to derive the perfective verb, which in turn contributes the completive or holistic meaning to the interpretation of (17). However, the perfective aspect of (17) does not function as a quantifier with respect to the variable introduced by the DO-NP 'voices', because 'voices' is not associated with the Incremental Theme role, but rather with the Stimulus role.

To take another example, in (18) the DO-NP 'coal' is associated with the traditional Theme or Patient role, however, it is not the Incremental Theme.

(18) *Přinesl*P   *ze sklepa*   *uhlí.*
      PREF-carried-SG   from-PREP basement-SG-GEN   coal
      'He brought (some) coal from the basement.'

Clearly, it is not the amount (or any other property) of coal that is intrinsically tied to the delimitation of the denoted motion event. The 'object' that stands here in a one-to-one relation to the event is the Path. The prepositional phrase 'from the basement' indicates its beginning. The holistic effect of the perfective operator concerns the Incremental Path Theme. In other words, (18) entails that the whole Path was traversed by the Agent. This explains why the perfective aspect does not require the universal ('all', 'whole') and bounded interpretation of the DO-NP in (18).

Notice that unlike the examples given in (15), (17) and (18) are perfectly acceptable, even though the plural DO-NPs 'voices' and 'coal' are undetermined. It should be emphasized that in both (17) and (18), 'voices' and 'coal' can have a universal, bounded and definite interpretation, but it will stem from other contextual factors than aspect and verb semantics.

3. 3. 6 The bounded/unbounded distinction is orthogonal to the definite/indefinite distinction

The assignment of a definite interpretation works *in tandem* with the assignment of a universal (or holistic), and therefore also bounded, interpretation to undetermined mass and plural NPs associated with the Incremental Theme role. The correlation 'perfective aspect - definite Incremental Theme argument' is weakened or preempted if it is not the perfective aspect that is solely responsible for the holistic and bounded interpretation of the Incremental Theme argument. A case in point is the situation in which

THE INCREMENTAL THEME NP IS HEADED BY AN INHERENTLY BOUNDED NOUN.

(19) *Napsal*^{P} *nový*   *dopis.*
     PREF-wrote-SG   new-SG-ACC   letter-SG-ACC
     'He wrote a/the new letter.'

One possible motivation for this is as follows: Since *dopis* 'letter' is an inherently bounded noun, we need not identify its referent in the discourse in order to assign the holistic interpretation to it: that is, the writing of all of its parts was completed. This opens up the possibility for the NP *dopis* 'letter' in (19) to have an indefinite interpretation. The fact that the bounded interpretation is compatible with both the definite and indefinite interpretation suggests that the bounded/unbounded distinction is orthogonal to the definite/indefinite distinction.

     Another case is the following one:

THE INCREMENTAL THEME NP IS A MEASURE NP.

(20) *Vypil*^{P} *šálek kávy / láhev piva / jedno pivo.*
     'He drank (up)/had a cup of coffee / a bottle of beer / one beer.'

Measure NPs like 'a cup of coffee' or 'a bottle of beer', 'one [portion of] beer' are typically low in referential specificity. For example, we do not usually talk about a specific yard, a pint of beer, a cup of coffee (cf.: "the yard", "the pint of beer", "the cup of coffee"), we count such entities, but we do not take an interest in them individually as discrete particular participants in an event.

     Finally, the requirement that the Incremental Theme NP must be an undetermined mass and plural NP to be eligible for the definite interpretation induced by the quantificational effect of the perfective aspect is a necessary, but not a sufficient condition. Examples in which such Incremental Theme NPs in the scope of perfective aspect are not assigned a definite interpretation are the following ones:

DERIVATIONAL VERB OPERATORS THAT SERVE TO DERIVE PERFECTIVE VERB FORMS INCORPORATE VARIOUS QUANTIFICATIONAL AND CLOSELY RELATED NOTIONS.

(cf. Corollary 2 in (9)). Take, for example, the prefix *na-*, as in *nabrat*^{P} *vodu* 'draw (in) some water', *nachytat*^{P} *ryby* 'catch some fish', *nasbírat*^{P} *jahody* 'pick some strawberries', *nas포řit*^{P} *peníze* 'save

some money', *napéct*^P *chleba* 'bake bread', *nasmažit*^P *lívance* 'make pancakes', *navyrábět*^P *spotřební zboží* 'produce consumer goods'. The prefix *na-* here contributes the notion of gradual amassing or accumulation to the meaning of the verb it modifies[19]. It functions as a vague measure expression ('large or sufficient quantity') with respect to the Incremental Theme argument. This can be shown by the fact that the Incremental Theme can be modified with weak quantifiers like 'many/much', 'few/little' and 'some' (cf. Milsark 1974). However, it cannot be modified with strong quantifiers like 'every', 'each', 'all' (cf. Milsark 1974) and with definite numeral specifiers, because they clash with the notion of vague measure expressed by the prefix *na-*. This is illustrated by (21):

(21) *Nakoupil*^P   *hodně* / *koš*   / *?pět jablek.*
    PREF-bought-3SG a-lot-of/ basket-SG-ACC/ ?five apples-PL-GEN
    'He bought a lot of / a basket of / five apples.'

The Incremental Theme argument of *na*-verbs is not only low on an individuation scale, but also on a definiteness (contextual identifiability) scale. For example, if a question like 'Where did you buy these postcards?' introduces 'postcards' into the domain of discourse, we cannot appropriately answer with the verb *nakoupit*^P 'buy', because it takes a DO-NP whose referent is relatively low on a definiteness scale. Instead, the appropriate answer would contain the perfective verb *koupit*^P 'buy':

(22) *?Nakoupil*^P/*Koupil*^P   *jsem*   *je*   *v kiosku.*
    ?PREF-bought-SG/bought-SG am-AUX   them-PL-ACC in kiosk
    'I bought them in the kiosk.'

3. 4 The imperfective aspect and undetermined mass and plural DO-NPs

3. 4. 1 The imperfective operator and Incremental Theme

    Both (1a) and (1b) contain a homomorphic predicate mapping the event and its subparts into the object denoted by the Incremental Theme 'wine' and its subparts. The only difference between (1a) and (1b) is in verb aspect. The homomorphism hypothesis motivates the

observation the imperfective operator functions as a partitive modifier with respect to the Incremental Theme argument. Schematically, this can be represented as PART-V + Incremental.Theme = PART(V + Incremental.Theme). If an imperfective sentence like (1a) is used progressively, the Incremental Theme argument has a clearly partitive and unbounded meaning, paraphrasable with 'part of' or 'some' (unstresssed). Given that the Incremental Theme 'wine' in (1a) is unbounded, (1a) is unbounded or atelic, as well.

3. 4. 2 The co-occurrence of the features 'unbounded' and 'definite'

It is important to emphasize that the unbounded interpretation of undetermined mass NPs does not preempt their definite interpretation. For example, imperfective sentence (23) suggests that there was an unbounded amount of wine that is clearly identifiable in the discourse:

(23) *Pil víno, co mu jeho neúnavný hostitel stále doléval.*
'He was drinking the wine that his tireless host kept pouring [into his glass].'

Such examples provide further support for my claim that the definite/indefinite distinction is orthogonal to the bounded/unbounded distinction (see also section 3. 3. 6 for other examples). Furthermore, they clearly invalidate Krifka's suggestion to regard undetermined mass NPs in Czech as ambiguous and to postulate the 'indefinite and unbounded' meaning as one of their meanings.

3. 4. 3 Supporting evidence

3. 4. 3. 1 Nominal arguments that are not linked to the Incremental Theme role

The imperfective operator functions as a partitive modifier only with respect to the Incremental Theme argument, but not with respect to other arguments, such as traditional Patients, for example. (24) does not entail that only a part of the book was subjected to the event of holding, while other parts were not. Knowing what 'holding x (in someone's hands)' means we also know that in most situations the question whether a part of x or the whole of x was held does not arise.

(24) *Držel*^I   *v*   *ruce*   *knihu.*
    held-SG   in-PREP hand-LOC   book-SG-ACC
    'He was holding a/the book in his hand.'

3. 4. 3. 2 Quantification and numerical specification

There are systematic restrictions on the quantification and numerical specification of the Incremental Theme argument in imperfective sentences. To illustrate this point consider the following examples:

(25) a. strong quantifiers

Pil^I   (?)*všechnu*   *kávu.*
drank-SG   (?)all-SG-ACC coffee-SG-ACC
'He was drinking (?)all the coffee.'

(25) b. weak quantifiers and numerical-specifiers

Pil^I   (??)*hodně*   *kávy*   / (?)*dvě* *kávy.*
drank-SG (??)a-lot-of   coffee-SG-GEN   / (?)two coffees-PL-GEN
'He was drinking a lot of coffee / two cups of coffee.'

By contrast, quantified or numerically-specified Incremental Theme arguments are unconditionally acceptable in perfective sentences. The substitution of the imperfective verb *pil*^I with the corresponding perfective verb *vypil*^P in (25a) and (25b) yields perfectly acceptable sentences.

There no restrictions on the quantification and numerical specification of nominal arguments that are not linked to the Incremental Theme in imperfective sentences, as (26) shows:

(27) a. strong quantifiers

Václav   *nesl*^I   *všechny*   *balíky*   *na poštu.*
Václav   carried-SG all   packages-PL-ACC   to post-office
'Václav was carrying/carried all the packages to the post office.'

(26) b. weak quantifiers and numerical-specifiers

Slyšel^I   *několik hlasů*   / *tři hlasy*   *na chodbě.*
heard-SG several voices-PL-GEN /   three voices-PL-ACC   on corridor
'He heard several voices / three voices in the corridor.'

The contrast between (25) and (26) can be explained if we assume that only in (25), but not in (26), the imperfective aspect functions as a partitive quantifier with respect to the quantified and numerically-specified NP. It still needs to be explained is why exactly partitivity (in the sense of 'not necessarily proper-part of') clashes with the overt expression of quantification and numerical-specification[20].

A similar contrast can be observed in English. (27) and (28), taken from Jackendoff (1990:101), show that the partitive reading assigned to the Incremental Theme in the scope of imperfective aspect clashes with the quantifier *some*:

(27) a. ??*Some water was rushing out of the faucet.*
(27) b. ??*Some people were streaming into the room.*

However, *some* is acceptable in sentences with simple verb forms:

(28) a. *Some water rushed out of the faucet.*
(28) b. *Some people / Fifty people streamed into the room.*

We do not find such a contrast with nominal arguments that are not linked to the Incremental Theme:

(29) a. *Some water was glistening in the distance / glistened in the distance.*
(29) b. *Some people   were waiting in line.*
     Some people/ Fifty people were waiting in line   / waited in line.

"(?)" and "(??)" in (25) and (26) indicate that such examples are not unconditionally unacceptable, but we have to do a certain amount of work to find a suitable interpretation and context of use for them. Czech imperfective sentences with quantified or numerically-specified Incremental Theme arguments are acceptable if they have a habitual interpretation or if they are construed as denoting a complex event consisting of a number subevents. In the latter case, the subevents may stand in a *consecutive* or *simultaneous* relation to each other. For example, a Czech imperfective sentence with a universally quantified or numerically-specified Incremental Theme argument, such as *Marie čistila[I] pět lžiček / všechny lžičky - Mary was polishing five spoons / all (the) spoons*, is appropriate in a context in which Mary is polishing the spoons *consecutively* or *simultaneously*. Under the consecutive interpretation, Mary systematically works her way through the spoons, polishing one spoon after another. It is not necessary that at any time

of Mary's polishing one spoon, she must also polish any other spoon or all the other spoons[21]. The conditions under which a consecutive and/or simultaneous interpretation can be assigned to a given imperfective sentence and the relative scope of the aspectual operator and the quantified or numerically-specified NP[22] constitute some of the toughest questions in the domain of aspect and quantification.

3. 5 The Incremental Theme as subject

(30) a. *Vlaky   projíždĕly*[I]   *stanicí.*
　　　trains-PL-NOM   PREF-passed-SUF-3PL station-SG-INSTR
　　　'The trains were passing through the station.'

(30) b. *Vlaky   projely*[P]   *stanicí.*
　　　trains-PL-NOM   PREF-passed-3PL   station-SG-INSTR
　　　'(All) the trains passed through the station.'

Sentence (30a) with the imperfective verb *projíždĕt*[I] entails that there was an unbounded stream of trains passing through the station. Sentence (30b) with the perfective verb *projet*[P], on the other hand, entails that all the trains passed through the station. In other words, the Incremental Theme *vlaky* 'trains' is assigned a partitive interpretation in imperfective sentence (30a) and a universal or holistic interpretation in perfective sentence (30b).

　　Vlaky 'trains' is most likely to have a definite interpretation in both (30a) and (30b), regardless of the partitive/holistic reading induced by verb aspect. This is attributable to the observation that subjects often function as topics. Moreover, topicalized constituents that occur in a sentence-initial position are often definite.

　　Notice that such examples as (30a) provide further support for the claim made above (section 3. 3. 6) that the definite/indefinite distinction is orthogonal to the bounded/unbounded distinction. In (30a) the Incremental Theme argument has a partitive, unbounded and definite interpretation. Notice that this also holds for the Incremental Theme argument realized as subject in English sentences like (cf. Jackendoff 1990:101).

(31) a. *The water was rushing out of the faucet.*
(31) b. *The people were streaming into the room.*

If progressive is replaced by simple past, the event may be viewed as temporally bounded. Consequently, "the amount of water and the number of people is also bounded" (Jackendoff 1990:101):

(32) a. *The water rushed out of the faucet.*
(32) b. *The people streamed into the room.*

Speakers of Czech can resort to various word order permutations to convey the differences in definiteness. If we put the subject-NP *vlaky* 'trains' in a sentence final position, it is likely to express new information, in which case the indefinite interpretation '(some) trains' will become available. The imperfective sentence *Hranicí projížděly*[I] *vlaky* will then mean 'There were (some) trains crossing the border'. The corresponding perfective sentence *Hranicí projely*[P] *vlaky* can be translated as 'Some trains crossed the border' or 'The trains crossed the border'. Such examples as well as those in (30) clearly show that in order to assign a definite or an indefinite interpretation to undetermined NPs in Czech, we also need to take into account the grammatical function of arguments, word order and the information structure of sentences.

3. 6 The categories 'definite' and 'indefinite'

The above examples show that undetermined NPs with mass and plural noun heads should not be treated as ambiguous between a definite/bounded and an indefinite/indefinite interpretation, contrary to what Krifka suggests. There are two main reasons for this. First, the distinctions 'indefinite/definite and 'bounded/unbounded' are orthogonal to each other. Second, undetermined NPs in languages like Czech that have no overt articles should not be treated as ambiguous between a definite and an indefinite interpretation. Rather, in such languages, the (in)definiteness category does not belong to the system of grammatical categories, it is neither a syntactic nor a semantic category.

As is well-known, the interpretation of NPs as definite or indefinite depends not only on the determiners and cases, but also on a variety of contextual factors in the sentence-internal linguistic context,

the discourse-level linguistic context and the external context of the utterance. A commonly held view is that the categories 'definite' and 'indefinite' are not limited to the NP and to the formal expression by means of articles. It has also been suggested that the categories 'definite' and 'indefinite' are not discrete categories, but rather cluster concepts, each characterized by a number of properties[23]. To the extent that it would be empirically and theoretically inadequate to limit the formal expression of the 'definite' and 'indefinite' categories to articles, it would also be inadequate to associate the definite and indefinite interpretation of NPs with two different senses of NPs.

4 Conclusion

The notion of 'Incremental Theme' provides us with a powerful tool for analyzing a wide range of seemingly unrelated data. It motivates not only the influence of nominal arguments on the telicity of verb predicates (cf. Krifka 1986, 1989, 1992; Dowty 1988 and 1991), but also the converse case, namely the influence of verb predicates, their aspectual properties in particular, on the interpretation of nominal arguments in Slavic languages (cf. Krifka 1986, 1989 and 1992).

One of the tasks for the future research is to spell out how the Krifka-Dowty's approach can be combined with the research on quantification and semantic typology initiated by Partee, Bach and Kratzer (1987), as well as others who have followed their lead.

Footnotes

1. According to Wierzbicka (1967), for example, the direct object of certain perfective verbs in Polish includes two elements in its semantic structure: "the number (one thing, or one set of things) and

the quantifier (all, whole). In Russian, Forsyth (1970) notices that "[...] verb plus object in such a sentence as *on pil čaj* 'he drank tea' or 'he was drinking tea', may be looked upon as a coalesced unit in which the object has no specific reference, whereas in *on výpil [....] čaj* the object is specific - 'he drank the tea'" (Forsyth 1970:92). Chvany (1983:71) points to "[a]nother well-known correlation in Russian is that of definite direct objects with perfective aspect, accusative case and holistic interpretation, while imperfective aspect, genitive case and partitive interpretations associate with indefiniteness" (Chvany 1983:71).

2. A similar idea can be already found in Wierzbicka (1967) who observes that Polish verb aspect influences the semantic structure of direct objects of two classes of verbs, namely verbs of consumption (*eat, drink*) and verbs of creation (*build, write*).

3. By 'object' I mean an ordinary object like a pencil or a human being like my friend. However, the term 'object' also includes abstract objects such as love. This use of the term 'object' can be found in Carlson (1977 and 1979), among others.

4. In this respect, he builds on Link's (1983) *lattice* model of the domain of individuals, including ordinary individuals like Mary, plural individuals like those denoted by *the students* or *Mary and John* as well as quantities of matter.

5. The notion of 'homomorphism' refers to the standard mathematical function, see Partee, ter Meulen and Wall (1990).

6. Cf. Verkuyl 1972-1989; Dowty 1972, 1979, 1991.

7. Dowty (1988, 1991) observes that many traditional Themes and Patients, i.e., those arguments that the predicate entails to move or undergo a change of state, are not Incremental Themes. For example, direct objects in *push a cart, dim the lights* are not associated with Incremental Themes, because the verbs imply an indefinite change of position or state. To take another example, *John* in *John walked from the bank to the post office* denotes an individual that undergoes a definite change of location. However, *John* is not the Incremental Theme. The object that stands in a one-to-one relation to the event is the Path denoted by the prepositional phrases. The 'Incremental (Path)

Theme' (cf. Dowty 1991:569) can be syntactically also realized as a direct object, as in *cross the desert*. At the same time, the class of Incremental Themes comprises arguments that are not traditional Themes and Patients: cf., for example, the direct object in *memorize a poem*.

8. Pollard and Sag (1987, 1992); Fillmore and Kay (1993)), for example.

9. The use of 'a/the' is meant to indicate that the NP is unspecified for definiteness. This translation does not indicate that the NP is ambiguous between a definite and an indefinite reading. We could also use 'some' in the context like: *He wrote some letter to the Dean, but I don't know what it was about.*

10. This view can be also found in Bennett (1981), for example, who suggests that the "progressive always *describes an activity*" (Bennett 1981:14-15).

11. In the most simple way, the 'imperfective paradox' or 'imperfective puzzle' can be summed up in the following question: 'How can we characterize the meaning of a progressive sentence *He was writing a letter* on the basis of the meaning of the corresponding simple sentence *He wrote a letter* when *He was writing a letter* can be true of a history without *He wrote a letter* ever being true?'

12. Cf. Taylor 1977, Bach 1981, 1986; Hinrichs 1985; and Krifka 1986, Jackendoff 1990, and many others.

13. This is labeled the constative general factual or simple denotative meaning of the imperfective (cf. Comrie 1976:113; Forsyth 1970:82-102).

14. This behavior of the Slavic imperfective aspect motivated the view that the imperfective represents the unmarked member in the privative opposition 'perfective/imperfective'. This view is well established, if not universally accepted, in Slavic aspectology. The principle of contrast on which it is based, the *privative opposition*, goes back to the Praguean markedness analysis (cf. Jakobson 1932 and 1936/71).

15. Exactly how the crossing of the initial or final boundary of a situation is to be construed depends on the combined lexical semantics

of the particular perfective operator and the verb root. Without going into further details, suffice it to say that perfective verbs provide speakers of Slavic languages with elaborate means for the expression of the initial and final phases of situations.

16. This distinction is important for the description of the perfective aspect. In addition, it also shows up in tests supporting other semantic categories. For example, Van Voorst (1992) shows that it is important in interpreting the occurrence of *almost* with Vendler's activities, states, achievements and states. With accomplishments, this adverb creates an ambiguity that does not occur with the other three classes: it can mean that the event either almost started or that the change of state was almost realized.

17. For further references, see V. V. Vinogradov (1947:497); Timberlake (1982, 1985); Forsyth (1970); Comrie (1976) and Dahl (1985).

18. This view can be traced back to Maslov (1959:309) and Razmusen (1891). See Forsyth (1970:8) and Comrie (1976) for further references.

19. Cf. Petr (1986, Vol. 1: 396, 3.1.8.2).

20. The interaction of aspect with NPs that contain determiner quantifiers, numerical-specifiers and other expressions of quantity has puzzled linguists working on Slavic languages (cf. Wierzbicka 1967; Rassudova 1977; Merrill 1985; among others). Slavic linguistics has so far failed to provide an adequate description for this interaction. In this section, I have suggested that we can easily describe it, if we recognize that the Incremental Theme argument provides the missing semantic link in this puzzle.

21. See Taylor (1977:215) for a discussion of this example.

22. Cf. also Kearns, K. S. 1991; Tenny, C. and Heny, F. 1993.

23. See Chvany (1983:86), for example, on the categories 'definite' and 'indefinite' in Slavic languages. The view that the categories 'definite' and 'indefinite' are not exclusively tied to their formal expression within the NP can be also found in the research on quantification initiated by Partee, Bach and Kratzer (cf. Partee, Bach

and Kratzer 1987; Birner and Ward (1994) give a concise summary and discussion of various accounts that attempt to characterize the use of the definite article in English in terms of familiarity, uniqueness and relevance. They come to the conclusion that "pragmatic factors such as the inferred intent of the speaker and the differentiability of referents in context contribute crucially to the interpretation of the definite article".

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