Theoretical and Crosslinguistic Approaches to the Semantics of Aspect

Edited by

Susan Rothstein
Bar-Ilan University

John Benjamins Publishing Company
Amsterdam / Philadelphia

Linguistik Aktuell/Linguistics Today (LA)

Linguistik Aktuell/Linguistics Today (LA) provides a platform for original monograph studies into synchronic and diachronic linguistics. Studies in LA confront empirical and theoretical problems as these are currently discussed in syntax, semantics, morphology, phonology, and systematic pragmatics with the aim to establish robust empirical generalizations within a universalistic perspective.

Volume 110

Theoretical and Crosslinguistic Approaches to the Semantics of Aspect
Edited by Susan Rothstein

∞™ The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences – Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

Library of Congress Cataloging-in-Publication Data

Theoretical and crosslinguistic approaches to the semantics of aspect / edited by Susan Rothstein.

p. cm. (Linguistik Aktuell/Linguistics Today, ISSN 0166-0829 ; v. 110)

Includes bibliographical references and index.

1. Grammar, Comparative and general--Aspect. 2. Semantics. 3. Typology (Linguistics) I. Rothstein, Susan Deborah.

P281.T44 2007

415'.63--dc22 2007031205

ISBN 978 90 272 3374 5 (Hb; alk. paper)

John Benjamins Publishing Co. · P.O. Box 36224 · 1020 ME Amsterdam · The Netherlands
John Benjamins North America · P.O. Box 27519 · Philadelphia PA 19118-0519 · USA

Events and maximalization

The case of telicity and perfectivity

Hana Filip
University of Florida

This paper advances the thesis that telicity in natural languages fundamentally relies on the maximalization operation in the domain of events. What counts as a maximal event in the denotation of a telic sentence in a given situation is derived from basic components of meaning that are directly related to the grammar of measurement and closely related scalar semantics. The maximalization operation on events is at the intersection of telicity in Germanic languages and the semantics of the grammatical category of perfectivity, as it is instantiated in Slavic languages, for example. Telicity viewed as maximalization on events provides us with a deeper understanding of the well-known differences in the way in which verbs interact with their nominal arguments and modifiers in the calculation of telicity of verb phrases and sentences in these two language families.

1. Introduction

The goal of this paper is to address the following basic questions: What is the nature of telicity? How is it encoded? How is the semantic property of telicity related to perfectivity, a formal property of verbs? The answers will be couched within a semantically and pragmatically motivated framework. The main thesis is that telicity relies on the maximalization operation in the domain of events (Section 2). Telic predicates denote events that are maximal with respect to an abstract representation of measurement, i.e., a scale. The maximalization operator on events MAX_E is applied to a partially ordered set of events, from which it picks out the unique largest event at a given situation. Its application thus presupposes that we can identify a scale that provides an ordering criterion on events, and the object-event homomorphism which induces an ordering on sets of unordered events. The sources of telicity are directly related to the grammar of measurement and closely related scalar semantics. MAX_E operates on asserted and implicated meaning components.

Predictions concerning the cross-linguistic variation in the encoding of telicity depend on what meaning components a given language packages into its verbs–verb

roots and morphological operations on verbs. What matters is how much of the information inducing an ordering on events is already entailed by the meaning of a verb and how much of it is expressed externally to it by a verb's arguments and modifiers, and at which level of the grammatical description. The division of labor between verb-internal vs. verb-external means of expression is the crucial factor in predicting whether MAX_E will apply to the denotations of verbs, *VP*'s or sentences in a given language. It also influences the details of the telic interpretation of a given sentence, and whether telicity is a matter of entailment or conversational implicature. This point will be first addressed by drawing on data from English (Section 3).

Telicity understood as the maximalization operation on events intersects with the semantics of the grammatical category of perfectivity. In Slavic languages (Section 4), nearly all verbs are aspectually marked as perfective or imperfective, and MAX_E is grammaticized in perfective verbs, the marked members of the aspectual opposition. Perfective verbs that introduce MAX_E into the logical representation of a sentence always pick out the largest unique event at a given situation. In Slavic languages, whenever a verb is used to describe some state of affairs, a choice must be made between a perfective or an imperfective verb, i.e., a choice between a maximal vs. non-maximal event description. This choice is not enforced among verbs by the grammar of Germanic languages, because they have no grammatical category of perfectivity. All expressions of the *V* category are unmarked with respect to maximality (telicity), just like imperfective verbs in Slavic languages are.

The analysis of telicity as maximalization on events has consequences for the theories of the parametric variation in the encoding of telicity advocated by current syntactic theories (cf. Kratzer 2004, Borer 2005, for example, and references therein). They propose that natural languages parametrically differ in the syntactic (and morphological) sources for the expression of telicity. In Germanic languages, the main burden for the encoding of telicity is on the direct object and telicity is a property of a *VP*. In contrast, in Slavic languages, it is on aspectually marked perfective verbs, with telicity of a *VP* (and a sentence) fully determined at the level of the *V* category. I will arrive at the conclusion that the variation in the encoding of telicity cannot be limited to syntactic factors, because telicity has no systematic expression in any dedicated syntactic operation, and is not systematically correlated with any overt morphology like the accusative case or a quantifier within a direct object *DP*, or a prefix on a perfective verb (cf. also Filip 2005b). In short, MAX_E is a covert operator. The observed 'object-marking' strategy (e.g., Germanic languages) vs. 'verb-marking' strategy (e.g., Slavic languages) for the encoding of telicity can be largely motivated by the lexical semantics of verbs interacting with the semantic and pragmatic components related to the grammar of measurement and scalar semantics, and their encoding by verb-internal vs. verb-external means in a given telic predication.

Telicity via maximalization on events also introduces an interesting twist on the way in which telicity has so far been conceived. It subsumes as a special case what has traditionally been its core: namely, the aspectual composition in Krifka-Dowty's semantic theory, or the 'inner aspect(uality)' of the *VP* in the syntactic approaches to telicity (cf. Verkuyl 1999, and others).

Finally, the semantic components that are presupposed by MAX_E, which are related to the grammar of measurement and scalar semantics, divide verbs into classes that do not neatly fit the traditional four-way Vendler classification or the tripartite classification into events, processes and states in Mourelatos (1978/81), Bach (1981) or Parsons (1990).

2. Proposal: Telicity via maximalization on events

In order to establish the central thesis of this paper, I will rely on a novel characterization of telicity, proposed in Filip and Rothstein (2005). In its most succinct form, it is stated in (1):

(1) Telicity corresponds to the *maximalization operator* MAX_E. It is a monadic operator, such that $MAX_E(\Sigma) \subset \Sigma$, which maps sets of partially ordered events Σ onto sets of maximal events $MAX_E(\Sigma)$.

In what follows, I will explain the guiding ideas behind (1). At the same time, I will establish explicit links between Filip and Rothstein's (2005) proposal, on the one hand, and the grammar of measurement and closely related scalar semantics, on the other hand. Given that MAX_E capitalizes on generalizations from two domains that are independently motivated and needed elsewhere in the grammar of natural languages, its introduction into the logical representation amounts to a natural extension of the existing conceptual and representational apparatus. In this respect, 'telicity-via-maximalization' has the distinct advantage over many other syntactic or semantic accounts of telicity that require a theoretical background sui generis. The implementation of (1) presupposes the following theoretical background:

(2) i. event semantics with lattice structures (Bach 1986, Link 1987, Krifka 1986, 1992, 1998);
ii. grammar of measurement (Krifka 1989, Schwarzschild 2002);
iii. scalar semantics: scalar implicature (Gazdar 1979, Horn 1972), generally taken to be of pragmatic nature and related to Grice's first *Submaxim of Quantity* (Grice 1967/75).

As is standard in Neo-Davidsonian event semantics, verb meanings are represented as one-place predicates of the eventuality argument. Each verb denotes a set of eventualities, or an eventuality type (cf. Bach 1981). Intuitively, telic predicates are taken to have (sets of) culminated or completed events in their denotation. What does it mean for a verbal predicate to denote a set of culminated or completed events?

Events never culminate *per se*, as Zucchi (1999) argues in his criticism of Parsons (1990).[1] For example, a particular drinking event may culminate with respect to the drinking of one bottle of wine, but not with respect to the drinking of just one glass of wine. Kratzer (2004), proposes that "[o]nly direct objects participate in defining culmination," with a caveat that measure and degree phrases also have this function (cf. ibid. fn. 5). In this respect, she builds on some suggestions made by Tenny (1987, 1994) and Ramchand (1997). Related to this is also Krifka's (1989) observation that events can never be directly measured, because they have no measurable dimension as part of their ontological make up. Take *John walked for an hour*, for example. What the temporal measure phrase *for an hour* here measures is the temporal trace standing in a homomorphic relation to the event of John's walking.

Telic predicates are also characterized as predicates that denote events "that can be directly or intrinsically counted," borrowing Mourelatos' (1981, p. 209) characterization. For example, *He crossed himself* entails the cardinal adverbial *(at least) once*, consequently, the events described by it can be counted with an iterative adverbial like *three times*, as in *He crossed himself three times.* In contrast, the process (atelic) verb *cry* specifies no criteria for what counts as one event of crying. Therefore, *(*)The baby cried three times last night* is felicitous just in case the context determines the relevant individuated chunks of crying, or 'quantized' units of crying, as Krifka (1986 and elsewhere) proposes. What is the nature of such countable units? One plausible answer is that counting involves *maximal entities* of some sort, as Kratzer (1990, p. 5) proposes, and Bartsch (1995, p. 33) states it as follows: "we can only quantify over (finite) maximal states and processes and not over non-maximal ones." Speculating about the nature of maximal states and processes, Dekker (2004) invites us to think of them as constituting 'coherent wholes,' and concludes: "states and processes will have to be mould into some discrete form before they can be subjected to adverbial quantification. Precisely how this happens, what operations are involved, and what presuppositions the structures of states and processes must fulfill for the operations to be able to work on them at all, that is a matter we must leave for another occasion" (p. 22).

Picking up where Dekker (2004) left off, and generalizing over the proposals mentioned in the two previous paragraphs (and many more of this type can be found in the vast body of research on telicity and perfectivity, to be sure), it is plausible to suggest that maximalization is in fact what provides a deeper understanding of the nature of telicity. Any maximalization operator requires that its argument introduce some *partial order (relativity of maximalization)*. Intuitively, if events never culminate *per se* (cf. Zucchi 1999), or have no measurable dimension (cf. Krifka 1998), which would allow us to demarcate them as discrete maximal units that populate the domain of

1. According to Parsons (1990), culmination is a property of events: *Cul(e,t)* is a relation between an event *e* and the time *t* at which it culminates.

adverbial quantification, what is needed is some partial order relative to which they can reach culmination or be *maximal.* The notion of a 'partial order' in turn formalizes the intuitive idea of an ordering of elements on a scale. A scale orders a set of elements based on the degree to which they possess a certain measurable property like their volume, temperature, length, weight, temporal extent, loudness, intensity, energy, etc. For example, we may measure wine in glasses or bottles, metal temperature in degree Celsius, a path in mile units, time in hours, or count apples, and such measured quantities can in turn provide a suitable scale and an upper bound for delimiting maximal events in the denotation of telic predicates: cp. *drink a glass of wine, cool the metal from 100°C to 30°C, run 3 miles, wait one hour, eat 3 apples.* Now, a particular drinking event may be maximal relative to a measure of one glass of wine (as in *drink one glass of wine*); or it may be maximal relative to one whole bottle of wine (as in *drink one bottle of wine*). The ordering of such quantities of wine in the order of their increasing magnitude constitutes the *scale of objects* with respect to which drinking events can count as maximal. The notion of an 'object' is here understood in a wide of sense: namely, comprising concrete objects like quantities of wine, ordered parts of a single bread stick, and also abstract objects like chunks of time measured by extensive measure functions such as HOUR.

Technically, a scale is characterized in terms of three parameters, following Kennedy (2005) and references cited therein:

(3)
- *a set of degrees* (measurement values) *totally ordered* with respect to some
- *dimension*, which indicates the property being measured (volume, temperature, length, weight, loudness, intensity, etc.); and
- *an ordering relation* on the set of degrees, which distinguishes between predicates that describe increasing properties (like *tall*) and those that describe decreasing properties (like *short*).

Here, the default ordering relation is '>' *greater than*, which is taken to mean 'having been assigned a higher/greater degree on a relevant property scale.' It is reflexive, antisymmetric and transitive, i.e., a partial order relation.

The maximalization operator MAX_E cannot be directly applied to a scale of objects. But a scale that measures quantities of wine, for example – a sip, one glass, two bottles, etc. – will provide a criterion for ordering drinking events according to the quantities of wine drunk: namely, an event of taking a sip of wine may develop into a larger event of drinking of one glass of wine, which in turn may eventually lead to an event of drinking of two bottles of wine, etc. We get an ordering of events, in which an event of drinking of one glass of wine can be viewed as "a more developed version" (Landman 1992, p. 23) of an event of taking a sip of wine, and so on, with 'smaller' events constituting stages of 'larger' ones. It is precisely this type of an ordering of events that satisfies the input requirement of the maximalization operator MAX_E, according to the characterization of telicity given in (1).

The mechanism by which parts of measuring scales are mapped onto parts of events presupposes that the ontological domains of events ($\mathcal{E}$), individuals (I) and times ($\mathcal{T}$) each has the structure of a complete join semilattice, and is (partially) ordered by the part relation '$\leq$' (cf. Link 1983, Bach 1986). The lattice structures are related by means of structure preserving mappings, or homomorphisms. They are used in Krifka (1986, 1998 and elsewhere) to define the Strictly Incremental Theme relation, as in (4):

(4) A part of the meaning of *strictly incremental (SINC)* verbs is characterized by a homomorphism entailment: a homomorphism between the lattice structure (part-whole structure) associated with the event argument *e* and the lattice structure associated with the Strictly Incremental Theme argument *x*. The thematic relation θ is *strictly incremental*, iff
   i. $\text{MSO}(\theta) \wedge \text{UO}(\theta) \wedge \text{MSE}(\theta) \wedge \text{UE}(\theta)$, and
   ii. $\exists x,y \in U_P \exists e,e' \in U_E [y<x \wedge e'<e \wedge \theta(x, e) \wedge \theta(y, e')]$

In (4), i. and ii. ensure a strict *one-to-one mapping* between the proper parts of *e* and the proper parts of *x*. Among the best examples of *SINC* verbs are verbs of consumption (*eat, drink*), creation (*build, write, construct, draw*) and destruction (*destroy, demolish, burn*). Such prototypical members of the *SINC* class have a Theme argument whose referent undergoes a gradual and permanent change of state in its PHYSICAL EXTENT/VOLUME and in this way determines the extent of the described event. *UO* (uniqueness of objects) is related to a general requirement on thematic relations viewed as functions (cp. also Carlson's (1984) 'thematic uniqueness'). *UE* (uniqueness of events) applies to events involving instantiations of objects that can be subjected to at most one event instantiation of a given type. *MSO* (mapping to subobjects) prohibits a proper part of *e* from being mapped to the whole object *x*. *UO*, *UE* and *MSO* apply to verbs like *eat*, but not to *read, push, ride* or *see*. *MSE* (mapping to subevents) guarantees that no proper part of *x* be mapped to the whole event *e*. It applies to verbs like *eat* and *read*, but not to *push, ride* or *see*. In addition, the *SINC* relation only applies to events *e* and objects *x* which have non-trivial proper parts. For example, it cannot apply to *notice a dot*.

The (Strictly) Incremental Theme relation mediates the well-known interactions between nominal and verbal predicates in *aspectual composition*. According to Krifka, if the (Strictly) Incremental Theme argument denotes a clearly delimited entity, the corresponding complex verbal predicate is telic, if it does not, the verbal predicate is atelic. As many have observed, and as it will become obvious further below, the interactions and mutual constraints between verbs and their Incremental Theme arguments are much more complicated than this.

Verbs like *eat* define a STRICTLY INCREMENTAL RELATION (SINC), verbs like *read* define an INCREMENTAL RELATION (INC). Verbs like *read* describe events to which parts of 'incremental' objects can be subjected more than once. For example, if there are two events of my reading of *Anna Karenina*, e_1 and e_2, there are two distinct subevents of my reading that are mapped to one and the same first chapter. Therefore, the individuation

and ordering of reading subevents cannot be based just on the parts of the book read; in addition, we need to rely on the temporal trace function τ (Link 1987) that homomorphically maps eventualities (the extension of $\mathcal{E}$), and their subparts, to their run times (the extension of $\mathcal{T}$). Crucially, what counts as 'one stage growing into another' larger one must be determined by some criterion that does *not* merely derive from the temporal trace of events, because any verb with some location in time and temporal extent would trivially satisfy MAX_E. Instead, the relevant ordering of events is determined by event participants that have their part structure ordered on some non-temporal scale, and it is this non-temporally based ordering of events from which MAX_E takes the largest unique events at a given situation.

It bears emphasizing that (strictly) incremental verbs are not lexically associated with a scale. The homomorphism they entail relates two denotational domains structured by the mereological part relation '$\leq$' and modeled as join semilattices. The part relation is defined from the mereological sum operation, and it is antisymmetric, transitive, and reflexive, i.e., a partial order relation. Such algebraic structures are clearly distinct from the notion of a 'scale,' as characterized in (3), and which is a total order, a linearly ordered set, or a chain. A total order is a linear extension of a partial order.

The scale with respect to which events described by (strictly) incremental verbs are ordered, and ultimately maximalized, must be specified externally to them. It is precisely their Theme argument that does the job: If a *SINC* verb is combined with a Theme argument that induces a scale with a lexically or contextually specified endpoint, the combination is a maximal (telic) predicate. The scale that imposes the partial ordering relation on events is incorporated in the lexical information constraining the *SINC* Theme relation, as also proposed by Filip and Rothstein (2005), and here repeated in (5):

(5) *MAX_E and Strictly Incremental (SINC) Theme relation*: MAX_E maximalizes a set of events (partially) ordered by the ordering criterion derived from the lexical information constraining the *SINC Theme* relation on that set of events.

The simplest cases of calculating the telicity of complex telic predicates relies on (5), because the mechanism by which the scale of events is induced directly follows the semantic composition of a sentence, and hence is a part of the grammar of natural languages. In so far as (5) relates maximalization on events to a specific thematic relation it is stricter than a similar thematically-based proposal by Landman (1998, p. 243, also 2004, p. 113), which regards maximalization effects in cumulative (plural) readings. In order to illustrate how (5) works, let us suppose that a given drinking event is describable by (6):

(6) John drank at least two bottles of wine (in an hour/*for an hour).

Drink on its own denotes a set of unordered drinking events. They may be ordered relative to the volume of some liquid stuff that is consumed. This works out nicely in (6), given that numerical phrases like *at least two* are lexically associated with a scale (cf. Gazdar 1979, Levinson 1984), and hence a part of the interpretation of the *SINC*

Theme argument *at least two bottles of wine* is a scale of objects. Its combination with *drink* yields the predicate *drink at least two bottles of wine*, which is associated with a scalar implicature, consisting of numerical statements describing events of differing sizes, due to the object-event homomorphism.

For example, among them will be e_1, an event of John's drinking of a half of a bottle of wine, e_2, an event of drinking of one bottle of wine, and also e_3, an event of John's drinking two bottles of wine, and so on. Since *at least two bottles* has no lexically specified endpoint due to the contribution of *at least*, neither does *drink at least two bottles of wine*. When applied to the denotation of *drink at least two bottles of* wine, MAX_E adds the requirement to pick (at a given situation) the largest unique event e_i, which leads to the most informative proposition among the alternatives in a given context; i.e., its size is measured relative to some contextually specified upper bound on the scale measuring the quantity of wine drunk. That is, when calculating what may count as such an event, we consider increasingly larger events as alternatives, drinking of a half of a bottle of wine, drinking of one bottle of wine, drinking of two bottles of wine, and so on. Suppose that our sentence is verified by a situation in which drinking of exactly two bottles of wine is the maximal event. MAX_E picks the event stage that corresponds to 'drink whatever quantity of wine is contained in two bottles.' The relevant upper bound to the described drinking event is assigned via scalar implicature, and the entire verbal predicate *drink at least two bottles of wine* receives a telic interpretation. It entails that all of the subquantities of wine contained in two bottles were drunk, and conversationally implicates that no more wine than that was drunk; it is defeasible, because (6) can be continued without a contradiction with '. . . and in fact, John drank four bottles of wine.' The application of the maximalization operator MAX_E relies on pragmatic inferences based on scalar implicatures (Horn 1972, Gazdar 1979, Levinson 1984), which are generally motivated by Grice's first submaxim of Quantity (Grice 1967/75).

A maximal event, say e_3, does not just amount to a plural event sum consisting of various 'smaller' events like e_1 (drinking of a half a bottle of wine) and e_2 (drinking of one bottle of wine), but instead such 'smaller' events are now reinterpreted as the *cross-temporally identical stages* (in the sense of Landman 2004, and (8) bellow) with the maximal event e_3 being the largest stage, and the stages e_1, e_2 and e_3 are ordered with respect to the single object, namely a single scale of two bottles of wine and its subparts. In short, MAX_E yields a predicate denoting a new single event.

(7) The maximal event represents a new entity in the domain of events, instead of being merely a maximal sum of events.

'Stage' is here understood in Landman's technical sense, introduced in (1992) and defined in (2007) as follows:

(8) If e_1 and e_2 are events and e_1 is a ***stage*** of e_2 ($e_1 \preceq e_2$) then:
i. *'Part of'*: $e_1 \leq e_2$, e_1 is part of e_2 (and hence $\tau(e_1) \subseteq \tau(e_2)$).

ii. *Cross-temporal identity*: e_1 and e_2 share the same essence: they count intuitively as the same event or process at different times.
iii. *Kineisis*: e_1 and e_2 are qualitatively distinguishable, e_1 is an earlier version of e_2, e_1 grows into e_2.

The account of telicity proposed here has four important consequences. First, if e_i falls under $MAX_E(P)$, then it cannot have a proper part e_{i-1} that also falls under the same $MAX_E(P)$, given that MAX_E picks out the maximal unique event at a given situation out of a set of events that satisfy the property described by *P*. But this means that $MAX_E(P)$ is quantized in the sense of Krifka's (1986, 1992 and elsewhere) definition: cp. A predicate *X* (e.g., *an apple, arrive*) is quantized iff no entity *y* that is *X* can be a proper subpart of another entity *x* that is also *X*. Since all quantized predicates are telic (cf. Krifka 1998), our analysis predicts that (6) will be compatible with the time-span adverbial *in an hour*, one of the standard diagnostics for telicity, but not with the durative adverbial *for an hour*.

Second, given that our analysis correctly predicts the telicity of examples like (6), it points to a new solution of the 'quantization puzzle' (cf. Partee p.c. to Krifka, Zucchi & White 1996, Filip 2000, Rothstein 2004, and others), which arises with predicates like *at least three x, a long/short x, a large/small quantity of x; many x, a lot of x, (a) few x, some x, most x; a ribbon*; *the* CN{mass|plural}. The puzzle they pose is as follows: On their own, they fail to be quantized, but they still compose with strictly incremental verbs to yield *VP*'s that are quantized/telic with respect to the diagnostic adverbials; this is, however, contrary to the principle of *aspectual composition* (cf. Krifka 1986, 1992 and elsewhere).

Third, verbs that are not strictly incremental, such as Vendler's *activities* like *push*, have no argument that could provide an ordering criterion for inducing scales of events. This predicts that events described by *push three carts* cannot be ordered by *three carts*, despite its scalar meaning, because, intuitively, the maximality of events of pushing of three carts depends on the length of the path and not the number of the carts. Therefore, in the absence of any other information, *push three carts* is atelic, non-maximal.

Fourth, strict incrementality on its own is insufficient to guarantee telicity, as (9) shows:

(9) John ate bread/sandwiches *in an hour / for an hour.

Since *ate bread/sandwiches* can be straightforwardly modified with the diagnostic durative adverbial *for an hour*, it is atelic. This in turn follows, given that MAX_E fails to apply to the denotation of the *VP*'s in (9), because mass (*bread*) and plural terms (*sandwiches*) generally have no scale lexically associated with them and trigger no scalar implicatures. Therefore, they cannot induce an ordering on a set of events in the denotation of a *VP*, when they saturate its *SINC* argument position. Consequently, the question of what constitutes the maximal event stage in the denotation of the *VP's*

in (9) at relevant situations cannot arise, and *eat sandwiches* and *eat bread* are non-maximal (or atelic). Combined with a Theme argument lacking any scalar information, a SINC verb yields a complex predicate that is non-maximal (atelic), just like the *SINC* verb itself.

The contrast between (6) and (9) clearly indicates that the crucial scalar information that leads to the maximal (telic) meaning of a complex predicate comes from the *SINC* Theme argument, and not the *SINC* verb itself. Therefore, *SINC* verbs are best viewed as unmarked with respect to telicity, they are atelic. The same holds for incremental (*INC*) verbs like *read*: cp. *John read grant proposals *in an hour / for an hour* vs. *John read the grant proposal in an hour / for an hour.* Hence, we may conclude (10):

(10) (Strict) incrementality does not guarantee maximality (telicity) of verbal predicates.

Using 'atelic' in the sense of 'unmarked' here presupposes that atelic verbal predicates just like mass nouns take their denotation from the non-atomic join semi-lattice, while the denotation of telic verbal predicates and count nouns is structured by means of the atomic join semi-lattice (cf. Bach 1986). In so far as the non-atomic join semi-lattice structure is more general than the atomic one, as Partee (1999) proposes, mass and non-atomicity are the *unmarked* case, whereas count and atomicity are the *marked* case.

The claim that (strictly) incremental verbs are inherently atelic (i.e., unmarked with respect to telicity) implies that they do not qualify as ACCOMPLISHMENTS/EVENTS; at the same time, they must be clearly distinguished from ACTIVITY/PROCESS verbs like *push*, which take no Incremental Theme argument. But this leads to an interesting conclusion that they do not neatly fit into Vendler's (1957) classification, or into Mourelatos' (1978/81) and Bach's (1981, 1986) tripartite distinction into STATES, PROCESSES and EVENTS, and must be taken as an eventuality type of its own kind (cf. also Filip 1993, 1999).

An account of telicity that relies on the maximalization operator MAX_E on events has not yet been proposed elsewhere in the literature, although there are proposals that emphasize as a contributing factor *either* measure semantics (cf. Krifka 1986, 1992, 1998; Filip 2000, 2005b, Kratzer 2004, for example) *or* scalar semantics (cf. Filip 1993, 1999, Hay et al 1999, Winter 2006, Rappaport Hovav, *this volume*, for example). Incremental changes have also been represented by means of a generalized directed path structure, as in Jackendoff (1996) and Krifka (1998). In Rothstein's (2004) implementation, in an accomplishment predicate, the incremental structure is imposed on an unstructured activity by relating it to a BECOME event. The use of the notion of a 'partial order' in motivating telicity phenomena also captures the long-standing intuition that telicity involves an incremental change evolving "in distinguishable separate stages, i.e., subevents," in Dowty's (1991, p. 568) terms.

3. Germanic languages

3.1 Telicity and underived verbs

The main point of this section is to establish that MAX_E fails to apply to denotations at the level of simple underived verb stems in Germanic languages. The main empirical evidence for this claim is here based on the lexical semantic properties of English verb stem. The grammar of English distinguishes two main types of verb stem. One comprises verbs denoting achievements, or 'momentaneous events,' as Bach (1981) calls them: cp. *find, leave, reach, spot, realize, find (a penny), lose (one's watch), burst.* This class is fairly limited in Germanic languages and also cross-linguistically. The majority of native English verb stem describe situations with some temporal extent, and they include Vendlerian states and activities (or 'processes' in Mourelatos' (1978/81) and Bach's (ibid.) terms).

Achievement verbs have sets of unordered singular events in their denotation. Since they describe eventualities whose onset and end are viewed as falling into a single moment (barring marked 'slow-motion camera' construals), all eventualities are of the same 'size', and cannot be ordered with respect to each other. Take an atomic sentence like *burst(x)*. It makes no sense to ask what could possibly constitute the largest unique eventuality token of bursting at a given situation, since it will always be true in a situation in which *x* undergoes a momentaneous transition from a state in which it is intact into another state in which it is not.

Know, believe, love are *static states* in the sense of Bach (1981, 1986), or Carlson's (1977) individual-level predicates, and describe 'tendentially stable' properties of individuals (cf. Chierchia 1995), meaning that they do not (easily) change throughout their life times. If John believes that the earth is flat, then he is likely to hold this belief for the duration of his life, all else being equal, and therefore, the question of what constitutes the largest unique eventuality of John's believing that the earth is flat at a given situation does not arise. MAX_E also fails to apply to *dynamic states* (in the sense of Bach 1981, 1986), which fall under Carlson's (1977) stage-level predicates: cp. *live, sit, stand, lie.* They describe temporary or contingent states, but entail no changes of state. Hence, *John stood on the corner* can be felicitously uttered in any situation in which John is standing on the corner, and it is also true of various subparts of that situation. If we compared two different snapshots of John's standing on the corner, we would not know which of these is supposed to be 'a more developed version' of the other.

Activity/process stem verbs include verbs like *rain, smile, work, play* and manner of motion verbs like *move, swim, dance*. They are all characterized by 'indefinite changes of state' (cf. Dowty 1979, *Chapter 3.8*). For example, *the ball moved* can be felicitously uttered in any situation in which the ball changed its location to any degree (cf. also Dowty 1979, p. 168), or even just rotated around its own axis to any degree. Manner of motion verbs have (at least) three arguments, for a moving object, a path, and an event, and they entail a homomorphism between the parts of a path and the parts of

an event. However, since the implicit path argument ranges over paths that are *unbounded* and *not directed*, their part structure cannot provide an ordering criterion for the ordering of events that MAX_E requires. Hence, stem verbs of manner of motion on their own are non-maximal, or atelic. An independent support for this claim is Talmy's (1985) typological generalization that the dominant lexicalization pattern for stem verbs of motion in Germanic languages is [MOTION + MANNER/CAUSE], with the (directed) PATH expressed externally to the verb stem by verbal affixes, particles or prepositional phrases.

In Section 2, a large class of stage-level verbs, namely strictly incremental verbs like *eat* and incremental verbs like *read*, was discussed. They entail a homomorphism between the part structure of the referent of their (Strictly) Incremental Theme argument and their event argument (see (5)), but crucially not an ordering criterion allowing events in their denotation to be ordered. The latter comes from their (Strictly) Incremental Theme argument, just in case it is lexically associated with a scale, or it is implied by the general world knowledge and context of use.

Are there any verb stems in English that would lexicalize *both* a scale providing the requisite ordering criterion on events *and* a homomorphism by which the ordering on events is induced? And if so, do such verbs necessarily have only maximal events in their denotation?

Such verb stems do in fact exist in English, and in other Germanic languages. They belong to the class of 'scalar (change)' verbs, and they have been extensively studied by Levin and Rappaport Hovav (1995, 2005). Some examples of this class are *grow, freeze, melt*. The property scale lexically associated with scalar verbs is predicated of the entity referred to by their Theme argument. Since the change in the relevant property of the referent of the Theme argument allows us to monitor the development of the event described by a scalar verb, such a verb also entails a homomorphism between the part structure of the property scale and the event argument, as Filip (1993, 1999) proposes. Scales lexically associated with scalar verbs are taken to be non-trivial (cf. also Levin and Rappaport Hovav, ibid.), which also means that they describe gradual changes of state. Put in terms of Krifka's (1986, 1998 and elsewhere) mapping relations, no (proper) part of the relevant scale is mapped to the whole of event *e*, and hence the mapping to subevents (*MSE*) applies to scalar verbs (see also (4) above). Since scalar verbs entail a property scale that bears a homomorphic relation to events in their denotation, such events will be automatically ordered by it. But this means that they satisfy the input requirement of MAX_E. In this respect, they are unique among English verb stems. However, they are not enforced by the English grammar to have just maximal events in their denotation, and occur in predications that freely shift between a telic and an atelic interpretation, depending on the context, as we see in (11). This leads me to proposing (12).

(11) The snow melted in six days / for six days, but it did not melt completely.

(12) Scalar entailment does not guarantee maximality (telicity).

Just like (strictly) incremental verbs, scalar verbs do not neatly fall under any of the standard eventuality types. Since they are inherently atelic (i.e., unmarked with respect to telicity), they cannot be assimilated with ACCOMPLISHMENTS or EVENTS (in the sense of Vendler and Mourelatos/Bach, respectively) and they also differ from atelic ACTIVITY/PROCESS verbs like *rain, laugh, sleep*, which are non-scalar.

To summarize, recasting telicity in terms of *maximalization on events* leads to what may be a surprising result: namely, achievement verb stems in English are *not* inherently telic, and there are no native stem verbs in English that have sets of accomplishments in their denotation. Since there no other classes of verbs that qualify as telic, we may conclude that all English stem verbs come out from the lexicon as atelic, i.e., unmarked with respect to telicity.

While English verb morphology is rather impoverished, other Germanic languages have a fairly elaborate system of derivational operations for forming verbs. Nevertheless, none of them seems to be systematically linked to telicity. For German prefixes, this claim is made by Kratzer (2003, 2004), for example. Since the limits on this paper do not allow me to go into more details, it is plausible to propose that expressions of the *V* category are atelic (i.e., non-maximal) in Germanic languages, at least as a working null hypothesis.

3.2 Telic VP's

3.2.1 *The interaction of MAX_E with (Strictly) Incremental and Scalar Verbs*

In Germanic languages, verbs come out from the lexicon unmarked with respect to telicity, as has been shown in the previous section. Almost any atelic verb may serve as a head of a telic predication, provided a scale can be retrieved from its context which supplies the requisite ordering criterion on events in its denotation. What constitutes a suitable ordering scale depends on the lexical material at the *VP*, and also *IP*, level, as well as on world knowledge, cognitive and pragmatic principles of interpretation. Most importantly, it is the lexical structure of atelic verb stems that influences the way in which the telicity of verb-headed expressions at the *VP* and *IP* level is computed. What matters the most is whether an atelic verb stem belongs to the (strictly) incremental class or the class of scalar verbs. Scalar verbs entail *both* a NON-TRIVIAL MEASURING SCALE *and* an OBJECT-EVENT HOMOMORPHISM, while (strictly) incremental verbs entail an OBJECT-EVENT HOMOMORPHISM. They are the best suited to head telic predications, and are integrated into complex telic predications in a way which is not shared by verbs lacking these two meaning components.

Let us first take telic predicates with *Strictly Incremental (INC)* verbs. (13) shows that negating of the final stage of events they describe leads to a contradiction or is very odd, which clearly suggests that maximality (telicity) is an *entailed* part of their meaning.

(13) *verb with a Strictly Incremental (SINC) Theme argument*
a. Mary ate three sandwiches, ??/*but only finished two.
b. I ate the whole slice of pizza, ??but didn't finish eating it.
c. John composed the symphony, ?but died before he could finish it.

This follows given that the input requirement of MAX_E is recovered in a compositional way from the the verb and its *SINC* Theme argument. The ordering criterion is here 'mined' from the scale lexically associated with the *SINC* Theme argument. The verb entails the homomorphism by which the scale associated with the *SINC* Theme argument imposes an ordering on events described by the *VP*.

The class of *SINC* verbs is quite restricted, and so is the number of *VP*'s whose telicity can be computed in a systematic way by applying compositional semantic rules to independently motivated syntactic structures. In other words, the class of *VP*'s to which 'aspectual composition' in the sense of Krifka (1986, 1992) applies is rather restricted. There are many telic predicates denoting events whose extent is not (directly) determined by the physical extent/volume of the referent of one of their overtly expressed arguments, but instead by some other measurable dimension associated with events they describe. Just what it is and what type of scale will be activated to measure it will heavily depend on the context, world knowledge and cognitive principles of interpretation. Take a verb like *wash*. When it comes to washing what normally matters is a change along the implicit 'dirty/clean' scale predicated of the washed thing, and certain degree segments on this scale are lexicalized: cp. *dirty, half-clean, clean*. The ordered segments on this scale, which is predicated of the washed thing, are mapped to the subevents of the event of washing. Saying that the verb *wash* is associated with this type of knowledge means that it implies a mapping to subevents (*MSE*), and verbs of this type belong to a large class of incremental (*INC*) verbs.

The difference between strictly incremental verbs like *eat* and incremental verbs like *wash* is correlated with distinct grammatical reflexes related to telicity. In contrast to (13), in (14) we see that the Incremental Theme argument *three windows* induces a closed scale, but it does not enforce the telicity of (14): it does not entail that all the three windows were completely clean as a result of the event of washing. We can still continue (14) with clauses explicitly denying this meaning without a contradiction, as we see in (14b). (14) is associated with two different measuring scales: a scale measuring the property of cleanliness (associated with *wash*) that keeps track of the degree to which a given window is clean and a numerical scale (induced by *three*) that counts the number of windows that got clean. What (14) does entail is that only some change along one or both of these two scales took place.

(14) *verbs with an Incremental (INC) Theme argument*
John washed three windows
a. ... (clean) in an hour.
b. ... for an hour, but got only one of them clean / but none of them got completely clean.

The application of MAX_E may be triggered by the time-span adverbial *in an hour*, which requires a telic predicate as its input, as we see in (14a). The application of MAX_E may also be triggered as a nonce-implicature triggered by pragmatic principles of interpretation at a global or sentential level.

There are many verb stems that behave like *wash* in (14) in so far as they head *VP*'s that easily alternate between a telic and an atelic interpretation: cp. *read, examine, analyze, barbecue, roast, iron, bathe, comb, brush, fry, polish, explain, confuse, pollute, control, cover, insulate, test, decorate, describe, drain, mop, survey, check*. The list is taken from Kratzer (2004), and earlier also Partee (1999) noticed the existence of such *VP*'s. The ease with which *VP*'s of this type alternate between telic and atelic interpretations, in dependence on the context, leads Partee (1999) to proposing that they are unmarked with respect to telicity. This is also the position I take here. The ease with which such *VP*'s shift into a telic interpretation can be motivated if we assume that their head verbs have the mapping to subevents (*MSE*) as a part of their lexical meaning, and hence facilitate the application of MAX_E. In assuming the mapping to subevents (*MSE*) as a characterizing feature of this class of verbs, I build on the previous proposal by Krifka (1986, 1998 and elsewhere).

In a given predication headed by an *INC* verb of the *wash*-type, the details of the mapping rely not only on what is coded by the verb and its arguments but also on other knowledge sources, such as the general world knowledge associated with how events described by them typically, conventionally take place in the world and inferences based on this knowledge. They also help identify the suitable scale of objects involved in the mapping to subevents, and which induces the partial ordering on events required by MAX_E. When it comes to reading, it is the part-structure of the text that will provide the suitable scale of objects, when it comes to examining of a patient, it may be the steps of some predetermined examination procedure. Notice that this also means that MAX_E will operate on both asserted and implicated meaning components, which is also independently proposed by Landman (1998) for his maximalization operator.

Let us now turn to scalar verbs, illustrated by examples in (15). We see that predications headed by scalar verbs freely shift between a telic and an atelic interpretation, under the influence of temporal adverbials:

(15) a. We emptied/cleaned the kitchen in/for two hours.
b. The tailor lengthened my pants in/for an hour. Hay et al. 1999
c. The population of pandas in China decreased in/for ten years.

The behavior exhibited by scalar verbs in (15) is characteristic of scalar verbs as a whole class: (i) root scalar verbs of Germanic origin like *freeze* and *melt*; (ii) scalar verbs that are derived from gradable CLOSED SCALE adjectives like *clean, empty*, as in (15a), and from gradable OPEN SCALE adjectives like *lengthen, cool, dim*, as in (15b) (see also 'degree-achievement verbs' in Dowty 1979, pp. 88ff.); and (iii) scalar verbs of Latin origin like *increase, decrease*, as in (15c).

Notice that even verbs that are lexically associated with a closed scale like *empty* and *clean* freely occur in an atelic predication, as we see in (15a). Moreover, the past tense use of such verbs does not *entail* that the absolute maximal degree of the scale was reached, because we may negate it without a contradiction, as Rappaport Hovav (*this volume*) observes. (Some people might find (16b) odd.)

(16) a. I cleaned my system and still found file fragments on my C:drive, why is that?
b. I emptied the tub, but not completely. Rappaport Hovav *this volume*
c. This theater is empty for a theater showing a popular movie. Kennedy (*to appear*)

This behavior may not be surprising if we compare it with the behavior of the corresponding closed scale gradable adjectives like *empty*, as in (16c), which is not a contradiction. As Kennedy (*to appear*) observes, we may use an explicit domain restriction like a *for*-PP to shift the standard maximal degree of a closed scale adjective (or a 'maximum standard absolute adjective' in his terms) like *empty*, and derive a relative interpretation. Although the standard of comparison will normally default to one of the endpoints of the scale they entail, it may be overridden by the context that resets the endpoint value to some relatively low non-zero degree. Hence, according to Kennedy (ibid.), such examples do not invalidate the relative/absolute distinction in the domain of scalar adjectives. Similarly in (16a,b), the second clause provides a contextual restriction that shifts the default maximum standard of the implied scale, and events described by the first clause end with respect to some endpoint value that is less than the absolute maximum standard. Scalar verbs that are lexically associated with closed scales only specify what constitutes the maximal upper bound of events described by them, but the maximality requirement that it be actually reached may be imposed by the context of their use. This view would seem to be compatible with Rappaport Hovav's argument (*this volume*) that scalar verbs entail some change along the scale they are lexically associated with, but the change along the entire scale is only inferred by conversational implicature, governed heavily by pragmatic conditions.

In sum, since a scalar verb and a predication headed by it are unmarked with respect to telicity, we may conclude (17):

(17) Closed scales do not guarantee maximality (telicity).

The semantics of scalar verbs is explored in Rappaport Hovav (*this volume*), in Hay et al (1999), in Rothstein (2004), Kearns (2007) as well as in the numerous works they cite. In what follows, I will briefly mention three among their distinguishing features that have grammatical reflexes related to telicity, and support the view of telicity as maximalization on events. First, a predication headed by a scalar verb may be easily assigned a telic interpretation, even if the scale lexicalized by the verb is open and is not overtly expressed, provided its intended maximal degree is understood from the context, as we see in (18). The ease with which scalar verbs facilitate telic interpretations

of predications they head is straightforwardly motivated by the account of telicity proposed here: namely, a scale that is lexically associated with a scalar verb directly induces a partial ordering of events, which in turn sanctions the application of MAX_E.

(18) The heating oil price grew (from 190.0 to 198.0 cents per gallon) in a month.

In contrast, predications headed by non-scalar verbs require that the scale inducing an ordering on events be overtly expressed or can be recovered from the linguistic context, as in Dowty's (1979, p. 61) example *Today John swam in an hour*. This sentence is felicitous if the speaker and the addressee know that John is in the habit of swimming a specific distance every day, and today he swam that distance in an hour. Obviously, the shift of *swam* into a telic interpretation in the above sentence is connected with a considerable interpretive effort.

Second, a scale that is given a grammatical expression must be predicated of an entity that is overtly expressed, as Rappaport Hovav (*this volume*) suggests. It motivates the observation that the Theme argument of verbs of scalar change cannot be omitted (19), and a non-subcategorized Theme argument must be added to a non-scalar verb when it is combined with an expression inducing a scale that cannot be predicated of any of its subcategorized arguments (20).

(19) The cook caramelized *(the sugar).

(20) a. The dog barked *(the baby) awake.
b. The supermodel ate the cracker to the last crumb/*(herself) out of the modeling business.

Rappaport Hovav's constraint is a strong tendency, although not an absolute constraint, given that the Theme argument of a scalar verb can be omitted, as we see in (21), if the identity of its intended referent is canonical, or known from the context (cf. Fillmore's (1986) *Definite Null Instantiation* of omissible arguments).

(21) We cleaned yesterday, vacuumed and ran five loads of laundry.

Third, scalar verbs sanction result *XP*'s whose scales are semantically compatible with the scales they themselves lexicalize, and do not introduce a new separate scale with an additional ordering on events. A result *XP* (*AP* or *PP*) lexically specifies the maximal degree or at least some relatively high degree of an implied property scale. Its maximal degree must match the maximal degree on a closed scale lexicalized by a scalar verb (22a), or it supplies the endpoint to an open scale lexicalized by a scalar verb (22b).

(22) a. The lake froze solid / *dead / *hot.
b. He cooled the metal to the room temperature / *flat / *shiny.

In contrast, verbs that are non scalar are compatible with a wider range of result *XP*'s. However, we also observe that the Theme argument of Strictly Incremental (*SINC*) verbs constrains the admissible result *XP*: namely, if the Theme argument of a *SINC*

verb is lexically associated with a scale, the result *XP* can only provide more specific information to it, rather than a new scale, as we see in (23c).

(23) a. He wiped it clean/dry/smooth/*damp/*dirty/*stained/*wet.
b. The dictator whipped his hair into stiff peaks, artfully concealing his diminutive stature.
c. We ate the cake to the last crumb / *to death.

The constraints on the occurrence of result *XP*'s follow from the general prohibition against applying two different measures to one entity (cf. Filip 2004), because "we do not use the expressions that chunk up our experience with (singular) expressions that provide that experience already chunked up" (Bach 1981, p. 74). In the domain of verbal predicates, this corresponds to the intuitive "one delimitation per event" constraint, discussed by many (Simpson 1983, Rothstein 1983, Goldberg 1995, Levin & Rappaport Hovav 1995, Tenny 1994, Filip 2004, and many others).

3.2.2 *On the link between direct object and telicity*

Traditionally, telic *VP*'s that are headed by (strictly) incremental and scalar verbs have received the most attention in aspect studies. They provide the main empirical support for the claim that Germanic languages exploit the 'object marking' strategy for the encoding of telicity. In current syntactic theories (cf. Kratzer 2004, Borer 2005 and references therein), the observation that certain direct objects influence the telicity of a *VP* is taken to mean that the main burden for the encoding of telicity is on the direct object *DP*, and its morphology is assumed to be systematically linked to the telicity of a *VP*: namely, the accusative case marking, the definite article, certain quantifiers, and possessive pronouns, for example. Consequently, telicity in Germanic languages is a property of the *VP*, or at least the main theoretical interest derives from its encoding at the level of the *VP* and from the exploration of issues related to 'aspectual composition' (cf. Krifka 1992, 1998), 'inner aspect(uality)' (cf. Verkuyl 1999, and references therein) or 'compositional telicity'.

However, this cannot be taken to mean that *all* the direct objects, or *all* the direct objects with the designated overt morphology, enforce the telicity of *VP*'s. For example, it has been claimed that *all* the direct objects with overt quantifiers that specify some definite quantity lead to telic predicates (cf. Borer 2005, and references therein), but the contrast between (13) and (24) suggests otherwise:

(24) Julia carried three apples in her bag for a whole week / ??in a week.

Although (24) contains a direct object with the quantifier *three*, just like (13a), it is atelic under its most natural interpretation. It is also incompatible with the adverbial *in a week*, which shows that it cannot shift into a telic interpretation. The reason for this is straightforward: namely, *carry* does not entail a homomorphism that would map the scale of objects associated with *three apples* into carrying events and order them, and no other plausible ordering of events can be construed based on the general world knowledge evoked by *carried three apples*. Consequently, MAX_E fails to apply to *carried three apples*. We could propose that it appears under the inflectional head dedicated to telicity, because it fills the direct object slot, but the addition of the durative temporal adverbial *for a whole week* higher in the structure triggers the application of a covert higher imperfective operator that undoes the effect of the lower telic head, resulting in the atelic interpretation. For analogous German examples, this was proposed by Kratzer (2004 p405-6). However, this would open new questions about the constraints on the application of such a covert imperfective operator, and in English, it would also open questions about its relation to the overt progressive operator.

The contrast between (13a) and (24) constitutes one of the most convincing pieces of evidence for the grammatical status of the Strictly Incremental Theme relation, and the account of telicity proposed here into which it is embedded. In the past, there have been objections raised against its grammatical status, delegating the information about the relation between participants and events characterized by it entirely to pragmatics and general world knowledge (cf. Borer 2005, among others). If this type of information were undetermined by the grammar of natural language, then it should be possible to cancel the telic interpretation of (13a). But it is impossible, because telicity is an entailed part of its meaning. But how do we motivate the contrast between (13a) and examples like (24), if the Strictly Incremental Theme relation is not a part of the grammar of natural languages?

Another and related objection against the assumption that incrementality is entailed by verbs like *eat* (here, the class of Strictly Incremental (*SINC*) verbs) is raised by Jackendoff (1996) who points out that the verb *eat* does not change its meaning if the consumption happens holistically, rather than incrementally, as when a somebody eats a raisin in a single swallow. Therefore, the verb *eat* does not lexically require incrementality. To this it may be replied that using the verb *eat* to describe a 'holistic consumption' is not particularly fortunate in such a situation, given that there are other lexical items specialized to do the job like *swallow* or *gulp down*, and which represent a better world-to-word fit. Of course, the incrementality or graduality of *eat* derives from our real-world knowledge about the way in which eating normally or typically takes place (cf. also Krifka 1992, p. 45). Our real-world knowledge of this type determines how we classify states of affairs as an event of a certain type, as an eating, a swallowing, a gulping down, a climbing, a laughing, and this understanding is also constitutive of events as grammatical objects. In order to know what an event of eating or swallowing is about we must know what kind of participants it involves, and in what relation they normally stand to the event. A certain subset of such relations between participants and events is standardly taken to characterize thematic relations, and partly motivates the membership of verbs in coherent lexical semantic classes. Hence, saying that incrementality of *eat* is derived from our knowledge of how eating typically takes place in the real world is inseparable from saying that it is lexicalized in the meaning of *eat*.

To summarize, in discussing the link between the direct object and the telicity of a *VP*, what must be explained is the following contrast: namely, certain *VP*'s like

ate three sandwiches in (13a) require a telic/maximal interpretation, certain *VP*'s like *washed three windows* in (14) may have a telic/maximal interpretation triggered by a suitable linguistic and/or an extra-linguistic context, and certain *VP*'s like *carried three apples* in (24) cannot be shifted into a telic/maximal interpretation. This contrast cannot be motivated with recourse to the syntactic factors coming from the structure of transitive *VP*'s, because in this respect all three *VP*'s are alike; neither can it be motivated with recourse to the morphology of the direct object like the presence of a quantifier indicating a specific quantity, because the direct objects in all the three *VP*'s contain the cardinal quantifier *three*.

Why should there be a connection between the semantic property of telicity and the grammatical relation of the direct object? The answer does not ultimately lie in some syntactic explanatory mechanism. Instead, it is the semantic and pragmatic factors from which this link and its overt grammatical reflexes follow as a consequence. The contrast among the three types of *VP*'s above is straightforwardly predicted based on the differences in the lexical semantic properties of their main verbs, and their systematic interaction with the MAX_E operator. The application of MAX_E is the most closely tied to the class of strictly incremental verbs (*SINC*) like *eat*, and this link is captured in (5). With Strictly Incremental Theme verbs, it is the referent of the direct object that provides a part structure that is mapped onto a scale inducing an ordering on events needed for the application of MAX_E. Now, we also understand why expressions of quantity within the direct object *DP* are often taken to 'mark' telicity. The reason for this is that quantifiers carry the scale-inducing meaning component. As observed above, verbs of the *wash*-type also facilitate the application of MAX_E, because they are incremental in so far as they define a mapping to subevents. In contrast, MAX_E fails to apply to *VP*'s like *carried three apples* in (24), because they are headed by verbs that are not incremental, i.e., entail no object-event mappings, and provide no information that would facilitate the application of MAX_E to the denotation of predications headed by them.

The semantic and pragmatic account of telicity proposed here also motivates why the direct object of scalar verbs is implicated in calculating the telic interpretation of predications they head: namely, the direct object of scalar verbs denotes the entity the scale (entailed by scalar verbs) is predicated of; the scale provides a criterion for an ordering on events needed for the application of MAX_E.

As we have just seen, the structural and morphological properties of the direct object do not constitute a sufficient condition for the telicity of a *VP*. It can also be shown that they do not constitute a necessary condition. As is well-known, but often not mentioned, is the fact that the referent of the subject of inherently transitive verbs like *cross, penetrate, permeate, pass, skirt* influences the telicity of a sentence, as observed by Verkuyl (1972), Declerck (1979), Filip (1990), Dowty (1991), Jackendoff (1996), Levin and Rappaport Hovav (2005), for example.

(25) a. John entered the icy water (very slowly). Dowty 1991
b. At the turtle race, the winning turtle crossed the finish line in 42 seconds.

In current syntactic accounts of telicity, the crucial contribution of the subject argument to the telicity of sentences is a priori excluded. This follows from the independent assumption that external arguments (subjects) are not taken to be arguments of their verbs, and map to the part of the event structure that comprises a causer/agent, which lies outside of the event structure relevant to the calculation of telicity (cf. Kratzer 1996, Pylkkänen 2002, for example, and also many predecessors of this view like Marantz 1984, Tenny 1987, Moens & Steedman 1988, Larson 1988, Hale & Keyser 1993, Ritter & Rosen 1993). Consequently, no element above the functional projection dedicated to telicity (such as *AspP*) can contribute to the telicity interpretation of predicates. We might suggest that the subject argument *John* in *John entered the icy water (very slowly)* originates in the direct object position at some level of syntactic description and then moves into the surface subject position. However, such a movement strategy is not uncontroversial (cf. Dowty 1991, 571, fn. 15, and also Filip 1990).

To conclude, if the structural configuration that characterizes the direct object or its overt morphology constitutes neither a necessary nor a sufficient condition on the telicity of the *VP*, then it is fair to propose that the direct object is not systematically linked to the telicity of the *VP* in Germanic languages.

3.2.3 *The domain of application of* MAX_E

The semantic components that sanction the application of MAX_E come from the verb semantics, as we have seen so far with (strictly) incremental verbs and scalar verbs. If a telic predication is headed by a strictly incremental verb, its telicity is directly tied to the quantificational properties of its Theme argument, similarly as in Krifka's (1986, 1992) and Dowty's (1987, 1991) original 'aspectual composition' proposal. However, as already observed, the cases covered by aspectual composition are rather restricted. It is more common for telicity effects in a given predication not to be tied to any single semantic argument of a verb or even to a single combination of arguments and adjuncts. Related to this observation, and in departure from Krifka's (1986, 1992) and Dowty's (1987, 1991) versions of the telicity theory, I proposed (cf. Filip 1993, 1999) that telicity effects may result directly from constructions and the way verbs are integrated into them. One example is the directed motion construction, as instantiated by (26a–c):

(26) a. Mary waltzed into the room.
b. Mary swished into the room with a superior air.
c. Mary smiled into the room in which we were seated.

The directed motion construction is telic, if its *Goal-PP* implies a bounded path. The bounded path provides a scale and an upper bound for the described motion events as well as a criterion for their ordering. *Goal-PP*'s like *into the room* in the directed motion construction instantiated by (26a,b) can be also viewed as triggering scalar implicatures. For example, (26a) *Mary waltzed into the room* conversationally implicates that she did not waltz any further; it is defeasible, because it can be continued with '. . . she kept on waltzing all the way through the room and into the garden' without

a contradiction. The development of the event is tracked by the position of the moving entity (Holistic Theme) along the implied path. The ordering of the relevant motion (sub)events is ensured by a homomorphism from the part structure of the implied path into motion events.

The directed motion construction licenses verbs from two classes of atelic base verbs: namely, agentive manner of motion verbs (26a) and verbs of sound emission (26b), provided the sound is an involuntary and necessary concomittant of some motion (cf. Levin and Rappaport Hovav 1995). The telic interpretation and the related directed motion meaning are both a property of the directed motion construction, rather than of any of its part. They cannot be attributed to its head verb, because it is atelic and does not describe a directed motion, as we see in the above examples. Neither does it derive from *Goal-PP*. If it did, then the *Goal-PP* should also enforce a telic interpretation of (26c), but it does not, because the result of combining the atelic verb *smile* with *into the room* is still atelic.

The maximalization operator MAX_E is applied to a set of events partially ordered with respect to some suitable scale of objects. Identifying such a scale is the single most important factor in calculating the telicity of a given predication. The ease and difficulty with which a telic interpretation can be assigned to a given predication is directly related to how easy or difficult it is to identify the requisite scale that provides the ordering criterion on events. The scale can be a part of the verb semantics, as in the case of scalar verbs. In this respect, scalar verb stems are unique among atelic verb stems, and we have seen that their scalar entailment motivates the observation that predications they head can be easily assigned a telic interpretation even if the scale is not overtly expressed (see (18) above). Other atelic verb stems can only serve as heads of telic predications if the scale is overtly specified externally to them or recoverable from the context. In the simplest case, the scale is introduced by a Strictly Incremental Theme argument provided it is lexically associated with a scale, and the calculation of the telicity of a sentence follows the semantic composition of a sentence, as we have seen in (6).

Paradigm examples of expressions that are lexically associated with a scale and trigger scalar implicatures (cf. Gazdar 1979, Levinson 1984) are numerical phrases like *(at least/at most) three* as in *(at least/at most) three cats*, measure phrases like *three pounds (of)*, as in *three pounds (of) sugar*. *Goal-PP*'s like *into the room* in the above directed motion sentences (26a,b) also trigger scalar implicatures, and similarly other expressions of endpoints in a variety of event dimensions like the *result XP* (*AP* or *PP*) can be also seen as inducing scales. Since the integration of the *Goal-PP* or *result XP* into a given predication depends on the lexical semantics of its main verb and its arguments, the application of MAX_E will depend on meaning components distributed over the verb and its arguments as well as *Goal-PP* or *result XP*. This poses challenges for a compositional treatment of telicity, because the telicity of such predications cannot be calculated by compositional rules that directly operate on independently motivated syntactic structures.

In general, the presence of a scale-inducing expression in a given predication does not automatically enforce or facilitate its telicity, as we see in (26c), and as we have seen in connection with a scale-inducing quantified DO-DP *three apples* in the atelic *VP carried three applies* in (24). Such examples illustrate that it is a scale-inducing expression with verbs of certain well-defined lexical classes of verbs that together generate a partial ordering of events, which sanctions the application of MAX_E. In addition, contextual factors and general world knowledge are of paramount importance. Contrast the atelic *VP carried three applies* in (24) with *saw seventeen clouds* in (27). Although both *carry* and *see* are non-incremental and non-scalar, only (27), but not (24), may have a telic/maximal interpretation, because when it comes to our knowledge of visual perception we know that we can construe a seeing event as being ordered by the stimuli that are viewed in succession. (27a) presupposes a mapping from a scale of clouds to a scale of seeing events, based on the mapping to subevents (*MSE*).

(27) Mary saw seventeen clouds for three minutes / in three minutes. Krifka 1989

In (27), it is the numeral *seventeen*, a paradigm trigger of scalar implicatures, which facilitates the telic interpretation of the *VP*. Since *seventeen clouds* is lexically associated with a scale, it can function in a way in which a quantized Incremental Theme argument of *INC* verbs like *read* does, and impose an ordering on stages (or subevents) of a seeing event. (27) can be verified in a situation in which the described event counts as maximal with respect to the scale of seventeen clouds, all having been viewed in succession. Clearly, the requisite mapping into subevents is not a part of the verb's lexical meaning, but has its source in the numerical phrase *seventeen clouds* and in other knowledge sources inherent in the linguistic and extra-linguistic context.

The role of contextual factors and world knowledge is also highlighted by the contrast between (28a) vs. (28b). Based on examples like (28a), Dowty (1979, pp. 58ff.) observes that the combination 'achievement verb + bare plural/mass argument' is atelic. However, if we vary the lexical fillers in the direct object slot in a structurally parallel sentence (28b), the result is telic. ((28b) was suggested by one of the reviewers of this paper.) Even achievement verbs with bare (i.e., lacking overt determiners) plural or mass arguments can form complex telic predicates.

(28) a. John found crabgrass in his yard/fleas on his dog for six weeks / *in six weeks. Dowty (1979)

b. John found actors for his new play *for six weeks / in six weeks.

In both (28a) and (28b), the bare plural indefinite and mass noun induce a shift of the inherently singular achievement verb into a plural interpretation, generating a reference to a plurality of events. However, only in (28b), but not in (28a), the set of events can be construed as ordered with respect to each other. Based on our knowledge of plays, we know that a play has a finite number of characters and requires a finite number of actors to assume their roles in a given performance. The interpretation of (28b) involves an intentional search, whereby each actor found represents one definite event

a contradiction. The development of the event is tracked by the position of the moving entity (Holistic Theme) along the implied path. The ordering of the relevant motion (sub)events is ensured by a homomorphism from the part structure of the implied path into motion events.

The directed motion construction licenses verbs from two classes of atelic base verbs: namely, agentive manner of motion verbs (26a) and verbs of sound emission (26b), provided the sound is an involuntary and necessary concomittant of some motion (cf. Levin and Rappaport Hovav 1995). The telic interpretation and the related directed motion meaning are both a property of the directed motion construction, rather than of any of its part. They cannot be attributed to its head verb, because it is atelic and does not describe a directed motion, as we see in the above examples. Neither does it derive from *Goal-PP*. If it did, then the *Goal-PP* should also enforce a telic interpretation of (26c), but it does not, because the result of combining the atelic verb *smile* with *into the room* is still atelic.

The maximalization operator MAX_E is applied to a set of events partially ordered with respect to some suitable scale of objects. Identifying such a scale is the single most important factor in calculating the telicity of a given predication. The ease and difficulty with which a telic interpretation can be assigned to a given predication is directly related to how easy or difficult it is to identify the requisite scale that provides the ordering criterion on events. The scale can be a part of the verb semantics, as in the case of scalar verbs. In this respect, scalar verb stems are unique among atelic verb stems, and we have seen that their scalar entailment motivates the observation that predications they head can be easily assigned a telic interpretation even if the scale is not overtly expressed (see (18) above). Other atelic verb stems can only serve as heads of telic predications if the scale is overtly specified externally to them or recoverable from the context. In the simplest case, the scale is introduced by a Strictly Incremental Theme argument provided it is lexically associated with a scale, and the calculation of the telicity of a sentence follows the semantic composition of a sentence, as we have seen in (6).

Paradigm examples of expressions that are lexically associated with a scale and trigger scalar implicatures (cf. Gazdar 1979, Levinson 1984) are numerical phrases like *(at least/at most) three* as in *(at least/at most) three cats*, measure phrases like *three pounds (of)*, as in *three pounds (of) sugar*. *Goal-PP*'s like *into the room* in the above directed motion sentences (26a,b) also trigger scalar implicatures, and similarly other expressions of endpoints in a variety of event dimensions like the *result XP* (*AP* or *PP*) can be also seen as inducing scales. Since the integration of the *Goal-PP* or *result XP* into a given predication depends on the lexical semantics of its main verb and its arguments, the application of MAX_E will depend on meaning components distributed over the verb and its arguments as well as *Goal-PP* or *result XP*. This poses challenges for a compositional treatment of telicity, because the telicity of such predications cannot be calculated by compositional rules that directly operate on independently motivated syntactic structures.

In general, the presence of a scale-inducing expression in a given predication does not automatically enforce or facilitate its telicity, as we see in (26c), and as we have seen in connection with a scale-inducing quantified DO-DP *three apples* in the atelic *VP carried three applies* in (24). Such examples illustrate that it is a scale-inducing expression with verbs of certain well-defined lexical classes of verbs that together generate a partial ordering of events, which sanctions the application of MAX_E. In addition, contextual factors and general world knowledge are of paramount importance. Contrast the atelic *VP carried three applies* in (24) with *saw seventeen clouds* in (27). Although both *carry* and *see* are non-incremental and non-scalar, only (27), but not (24), may have a telic/maximal interpretation, because when it comes to our knowledge of visual perception we know that we can construe a seeing event as being ordered by the stimuli that are viewed in succession. (27a) presupposes a mapping from a scale of clouds to a scale of seeing events, based on the mapping to subevents (*MSE*).

(27) Mary saw seventeen clouds for three minutes / in three minutes. Krifka 1989

In (27), it is the numeral *seventeen*, a paradigm trigger of scalar implicatures, which facilitates the telic interpretation of the *VP*. Since *seventeen clouds* is lexically associated with a scale, it can function in a way in which a quantized Incremental Theme argument of *INC* verbs like *read* does, and impose an ordering on stages (or subevents) of a seeing event. (27) can be verified in a situation in which the described event counts as maximal with respect to the scale of seventeen clouds, all having been viewed in succession. Clearly, the requisite mapping into subevents is not a part of the verb's lexical meaning, but has its source in the numerical phrase *seventeen clouds* and in other knowledge sources inherent in the linguistic and extra-linguistic context.

The role of contextual factors and world knowledge is also highlighted by the contrast between (28a) vs. (28b). Based on examples like (28a), Dowty (1979, pp. 58ff.) observes that the combination 'achievement verb + bare plural/mass argument' is atelic. However, if we vary the lexical fillers in the direct object slot in a structurally parallel sentence (28b), the result is telic. ((28b) was suggested by one of the reviewers of this paper.) Even achievement verbs with bare (i.e., lacking overt determiners) plural or mass arguments can form complex telic predicates.

(28) a. John found crabgrass in his yard/fleas on his dog for six weeks / *in six weeks. Dowty (1979)

b. John found actors for his new play *for six weeks / in six weeks.

In both (28a) and (28b), the bare plural indefinite and mass noun induce a shift of the inherently singular achievement verb into a plural interpretation, generating a reference to a plurality of events. However, only in (28b), but not in (28a), the set of events can be construed as ordered with respect to each other. Based on our knowledge of plays, we know that a play has a finite number of characters and requires a finite number of actors to assume their roles in a given performance. The interpretation of (28b) involves an intentional search, whereby each actor found represents one definite event

stage of a whole event search that is delimited by the total number of actors needed to be cast in a play. The denotation of (28b) naturally involves a set of ordered events, which satisfies the input requirement of MAX_E. The telicity of (28b) is confirmed by the compatibility with *in six weeks*, the standard diagnostic for telicity.

But we cannot order events of finding of fleas on a dog in a parallel fashion, because a dog does not circumscribe the amount of fleas that can be found on it. Therefore, (28a) simply describes an indefinite and unordered plurality of events distributed over different times within an open-ended interval. But this type of denotation provides no information for us to make judgments about what constitutes the largest unique event of the finding of fleas at a given situation. Neither does it intuitively make sense to say that some indefinite plurality of events of the finding of fleas on John's dog naturally 'grows' into another larger indefinite plurality of events of the same type. Notice also that an ordering of events that derives from their temporal traces is insufficient to serve as a default ordering when no other ordering criterion on events can be retrieved from the lexical material in a sentence and/or its context of use. If it were the case, then (28a) also would by default and trivially satisfy the input requirement of MAX_E, but it does not. It is only compatible with *for six weeks* but not with *in six weeks*, which clearly indicates that it is atelic.

The observation that MAX_E fails to apply in sentences headed by achievement verbs like (28a) help us sharpen our understanding of its workings. It highlights a significant difference between MAX_E and the standard maximalization operator *MAX* on plural individuals. When applied to the denotation of a plural predicate, *MAX* selects the largest plural individual at a given situation, regardless whether its individual members are ordered. In contrast, MAX_E requires as its input a set with a non-trivial (partial) ordering on its members, and hence, it has a stricter input requirement than the maximalization operator *MAX* on plural individuals. Differences in the workings of the maximalization operation across the denotational domains of nominal and verbal predicates point to the differences between the two, and can be added to the inventory of the phenomena that motivate the existence of the separate lexical categories of verbs and nouns in natural languages.

To sum up, 'telicity via maximalization' leads to the following characterization of telicity in Germanic languages: (i) Verbs as lexical items are unmarked with respect to telicity. (ii) The maximalization operator MAX_E applies to the denotations at the level of *VP* (or *V'*) and *IP*, and it crucially relies on the lexical semantics of their head verb interacting with the semantics of its arguments, and a variety of contextual and pragmatic factors. What counts as a maximal event in the denotation of a given telic predicate is often not entailed by it, but inferred by a conversational implicature, and shifts of inherently non-maximal predicates to maximal interpretations are common. (iii) The maximalization operator MAX_E is a covert operator in Germanic languages. It is neither a lexical nor an inflectional feature of direct objects. Its application cannot be systematically linked to the grammatical relation of the direct object, or to some overt morphology of direct objects like the accusative case, definite article, a quantifier, or a measure expression, for example.

4. Slavic languages

4.1 Maximalization and perfectivity

There are several independent strands of research that make it plausible to propose that the maximalization operation on events is at the intersection of telicity in Germanic languages, and the semantics of perfectivity in Slavic languages. As observed above, one of the hallmark properties of telic predicates is their compatibility with adverbs of quantification, and quantifiers are taken to operate over maximal entities. In general, the notion of 'maximalization' relies on our knowledge of what integrated or coherent whole entities of certain types are. In Slavic linguistics, the notion of a 'totality of an event' or *celostnost' dejstvija* (Russian) is traditionally used to characterize the semantics of perfectivity. Perfective verbs are commonly taken to describe "the action as a total event summed up with reference to a single specific juncture" (Forsyth 1970, p. 8). "Perfectivity indicates the view of a situation as a single whole without distinction of the various phases that make up that situation," as Comrie (1976, p. 16) puts it. Almost all verbs in Slavic languages are aspectually marked as either perfective or imperfective. The membership in one of these classes is not determined by a set of formal means that unambiguously mark a verb as perfective or imperfective in all of their occurrences, but rather by a verb's syntactic distributional and semantic properties. For example, all perfective verbs in the present tense have the future time reference. Since the grammatical category of perfectivity is a property of verbs, whenever verbs are used to describe some states of affairs, a decision must be made whether it is to be expressed by a perfective verb, and represented as a maximal event. This decision is not enforced among verbs by the grammar of Germanic languages, because they have no grammatical category of perfectivity encoded by verbs, which accounts for a number of differences in the telicity effects in Germanic vs. Slavic languages.

4.2 Telicity and monomorphemic verbs

The vast majority of underived verbs are formally imperfective and semantically non-maximal. The class of such simple verbs that are perfective is quite restricted. For example, one of the most exhaustive lists of such verbs in Russian can be found in Isačenko (1962, §204, pp. 352–355) and it comprises almost fifty simple perfective verbs, not counting perfective verbs with the semelfactive suffix *-nu-* (which are derived), biaspectual and certain archaic perfective verbs.

Most perfective underived verbs denote events with some temporal extent: cp. Czech *říci* 'to say (i.e., to make a single speech act)', *spasit* 'to rescue'/'to save', *obléci (se)*[2] 'to dress', *navštívit* 'to (pay a) visit'; Russian *obléč* 'to dress', *skazát'* 'to say (i.e., to make a

2. Although there is also *vysvléci (se)* 'to take off (one's) clothes,' I take *obléci (se)* 'to dress' to be an underived or root verb, just like its cognate *obléč* 'to dress up' in Russian (see Isačenko 1962), because **bléci* or **vléci* do not exist on their own, neither can be assigned a meaning or a grammatical function.

stage of a whole event search that is delimited by the total number of actors needed to be cast in a play. The denotation of (28b) naturally involves a set of ordered events, which satisfies the input requirement of MAX_E. The telicity of (28b) is confirmed by the compatibility with *in six weeks*, the standard diagnostic for telicity.

But we cannot order events of finding of fleas on a dog in a parallel fashion, because a dog does not circumscribe the amount of fleas that can be found on it. Therefore, (28a) simply describes an indefinite and unordered plurality of events distributed over different times within an open-ended interval. But this type of denotation provides no information for us to make judgments about what constitutes the largest unique event of the finding of fleas at a given situation. Neither does it intuitively make sense to say that some indefinite plurality of events of the finding of fleas on John's dog naturally 'grows' into another larger indefinite plurality of events of the same type. Notice also that an ordering of events that derives from their temporal traces is insufficient to serve as a default ordering when no other ordering criterion on events can be retrieved from the lexical material in a sentence and/or its context of use. If it were the case, then (28a) also would by default and trivially satisfy the input requirement of MAX_E, but it does not. It is only compatible with *for six weeks* but not with *in six weeks*, which clearly indicates that it is atelic.

The observation that MAX_E fails to apply in sentences headed by achievement verbs like (28a) help us sharpen our understanding of its workings. It highlights a significant difference between MAX_E and the standard maximalization operator *MAX* on plural individuals. When applied to the denotation of a plural predicate, *MAX* selects the largest plural individual at a given situation, regardless whether its individual members are ordered. In contrast, MAX_E requires as its input a set with a non-trivial (partial) ordering on its members, and hence, it has a stricter input requirement than the maximalization operator *MAX* on plural individuals. Differences in the workings of the maximalization operation across the denotational domains of nominal and verbal predicates point to the differences between the two, and can be added to the inventory of the phenomena that motivate the existence of the separate lexical categories of verbs and nouns in natural languages.

To sum up, 'telicity via maximalization' leads to the following characterization of telicity in Germanic languages: (i) Verbs as lexical items are unmarked with respect to telicity. (ii) The maximalization operator MAX_E applies to the denotations at the level of *VP (*or *V')* and *IP*, and it crucially relies on the lexical semantics of their head verb interacting with the semantics of its arguments, and a variety of contextual and pragmatic factors. What counts as a maximal event in the denotation of a given telic predicate is often not entailed by it, but inferred by a conversational implicature, and shifts of inherently non-maximal predicates to maximal interpretations are common. (iii) The maximalization operator MAX_E is a covert operator in Germanic languages. It is neither a lexical nor an inflectional feature of direct objects. Its application cannot be systematically linked to the grammatical relation of the direct object, or to some overt morphology of direct objects like the accusative case, definite article, a quantifier, or a measure expression, for example.

4. Slavic languages

4.1 Maximalization and perfectivity

There are several independent strands of research that make it plausible to propose that the maximalization operation on events is at the intersection of telicity in Germanic languages, and the semantics of perfectivity in Slavic languages. As observed above, one of the hallmark properties of telic predicates is their compatibility with adverbs of quantification, and quantifiers are taken to operate over maximal entities. In general, the notion of 'maximalization' relies on our knowledge of what integrated or coherent whole entities of certain types are. In Slavic linguistics, the notion of a 'totality of an event' or *celostnost' dejstvija* (Russian) is traditionally used to characterize the semantics of perfectivity. Perfective verbs are commonly taken to describe "the action as a total event summed up with reference to a single specific juncture" (Forsyth 1970, p. 8). "Perfectivity indicates the view of a situation as a single whole without distinction of the various phases that make up that situation," as Comrie (1976, p. 16) puts it. Almost all verbs in Slavic languages are aspectually marked as either perfective or imperfective. The membership in one of these classes is not determined by a set of formal means that unambiguously mark a verb as perfective or imperfective in all of their occurrences, but rather by a verb's syntactic distributional and semantic properties. For example, all perfective verbs in the present tense have the future time reference. Since the grammatical category of perfectivity is a property of verbs, whenever verbs are used to describe some states of affairs, a decision must be made whether it is to be expressed by a perfective verb, and represented as a maximal event. This decision is not enforced among verbs by the grammar of Germanic languages, because they have no grammatical category of perfectivity encoded by verbs, which accounts for a number of differences in the telicity effects in Germanic vs. Slavic languages.

4.2 Telicity and monomorphemic verbs

The vast majority of underived verbs are formally imperfective and semantically non-maximal. The class of such simple verbs that are perfective is quite restricted. For example, one of the most exhaustive lists of such verbs in Russian can be found in Isačenko (1962, §204, pp. 352–355) and it comprises almost fifty simple perfective verbs, not counting perfective verbs with the semelfactive suffix *-nu-* (which are derived), biaspectual and certain archaic perfective verbs.

Most perfective underived verbs denote events with some temporal extent: cp. Czech *říci* 'to say (i.e., to make a single speech act)', *spasit* 'to rescue'/'to save', *obléci (se)*[2] 'to dress,' *navštívit* 'to (pay a) visit'; Russian *obléč* 'to dress,' *skazát'* 'to say (i.e., to make a

2. Although there is also *vysvléci (se)* 'to take off (one's) clothes,' I take *obléci (se)* 'to dress' to be an underived or root verb, just like its cognate *obléč* 'to dress up' in Russian (see Isačenko 1962), because **bléci* or **vléci* do not exist on their own, neither can be assigned a meaning or a grammatical function.

stage of a whole event search that is delimited by the total number of actors needed to be cast in a play. The denotation of (28b) naturally involves a set of ordered events, which satisfies the input requirement of MAX_E. The telicity of (28b) is confirmed by the compatibility with *in six weeks*, the standard diagnostic for telicity.

But we cannot order events of finding of fleas on a dog in a parallel fashion, because a dog does not circumscribe the amount of fleas that can be found on it. Therefore, (28a) simply describes an indefinite and unordered plurality of events distributed over different times within an open-ended interval. But this type of denotation provides no information for us to make judgments about what constitutes the largest unique event of the finding of fleas at a given situation. Neither does it intuitively make sense to say that some indefinite plurality of events of the finding of fleas on John's dog naturally 'grows' into another larger indefinite plurality of events of the same type. Notice also that an ordering of events that derives from their temporal traces is insufficient to serve as a default ordering when no other ordering criterion on events can be retrieved from the lexical material in a sentence and/or its context of use. If it were the case, then (28a) also would by default and trivially satisfy the input requirement of MAX_E, but it does not. It is only compatible with *for six weeks* but not with *in six weeks*, which clearly indicates that it is atelic.

The observation that MAX_E fails to apply in sentences headed by achievement verbs like (28a) help us sharpen our understanding of its workings. It highlights a significant difference between MAX_E and the standard maximalization operator *MAX* on plural individuals. When applied to the denotation of a plural predicate, *MAX* selects the largest plural individual at a given situation, regardless whether its individual members are ordered. In contrast, MAX_E requires as its input a set with a non-trivial (partial) ordering on its members, and hence, it has a stricter input requirement than the maximalization operator *MAX* on plural individuals. Differences in the workings of the maximalization operation across the denotational domains of nominal and verbal predicates point to the differences between the two, and can be added to the inventory of the phenomena that motivate the existence of the separate lexical categories of verbs and nouns in natural languages.

To sum up, 'telicity via maximalization' leads to the following characterization of telicity in Germanic languages: (i) Verbs as lexical items are unmarked with respect to telicity. (ii) The maximalization operator MAX_E applies to the denotations at the level of *VP (or V')* and *IP*, and it crucially relies on the lexical semantics of their head verb interacting with the semantics of its arguments, and a variety of contextual and pragmatic factors. What counts as a maximal event in the denotation of a given telic predicate is often not entailed by it, but inferred by a conversational implicature, and shifts of inherently non-maximal predicates to maximal interpretations are common. (iii) The maximalization operator MAX_E is a covert operator in Germanic languages. It is neither a lexical nor an inflectional feature of direct objects. Its application cannot be systematically linked to the grammatical relation of the direct object, or to some overt morphology of direct objects like the accusative case, definite article, a quantifier, or a measure expression, for example.

4. Slavic languages

4.1 Maximalization and perfectivity

There are several independent strands of research that make it plausible to propose that the maximalization operation on events is at the intersection of telicity in Germanic languages, and the semantics of perfectivity in Slavic languages. As observed above, one of the hallmark properties of telic predicates is their compatibility with adverbs of quantification, and quantifiers are taken to operate over maximal entities. In general, the notion of 'maximalization' relies on our knowledge of what integrated or coherent whole entities of certain types are. In Slavic linguistics, the notion of a 'totality of an event' or *celostnost' dejstvija* (Russian) is traditionally used to characterize the semantics of perfectivity. Perfective verbs are commonly taken to describe "the action as a total event summed up with reference to a single specific juncture" (Forsyth 1970, p. 8). "Perfectivity indicates the view of a situation as a single whole without distinction of the various phases that make up that situation," as Comrie (1976, p. 16) puts it. Almost all verbs in Slavic languages are aspectually marked as either perfective or imperfective. The membership in one of these classes is not determined by a set of formal means that unambiguously mark a verb as perfective or imperfective in all of their occurrences, but rather by a verb's syntactic distributional and semantic properties. For example, all perfective verbs in the present tense have the future time reference. Since the grammatical category of perfectivity is a property of verbs, whenever verbs are used to describe some states of affairs, a decision must be made whether it is to be expressed by a perfective verb, and represented as a maximal event. This decision is not enforced among verbs by the grammar of Germanic languages, because they have no grammatical category of perfectivity encoded by verbs, which accounts for a number of differences in the telicity effects in Germanic vs. Slavic languages.

4.2 Telicity and monomorphemic verbs

The vast majority of underived verbs are formally imperfective and semantically non-maximal. The class of such simple verbs that are perfective is quite restricted. For example, one of the most exhaustive lists of such verbs in Russian can be found in Isačenko (1962, §204, pp. 352–355) and it comprises almost fifty simple perfective verbs, not counting perfective verbs with the semelfactive suffix *-nu-* (which are derived), biaspectual and certain archaic perfective verbs.

Most perfective underived verbs denote events with some temporal extent: cp. Czech *říci* 'to say (i.e., to make a single speech act)', *spasit* 'to rescue'/'to save', *obléci (se)*[2] 'to dress,' *navštívit* 'to (pay a) visit'; Russian *obléč* 'to dress,' *skazát'* 'to say (i.e., to make a

2. Although there is also *vysvléci (se)* 'to take off (one's) clothes,' I take *obléci (se)* 'to dress' to be an underived or root verb, just like its cognate *obléč* 'to dress up' in Russian (see Isačenko 1962), because **bléci* or **vléci* do not exist on their own, neither can be assigned a meaning or a grammatical function.

single speech act)', *otvétit'* 'to answer (i.e., to give an answer)', *posetít'* 'to (pay a) visit.' They also include verbs that entail some transfer of goods culminating in what is often taken to involve a punctual change of possession: cp.: *dat'* (Russian) – *dát* (Czech) 'to give', *vzjat'* (Russian) – *vzít* (Czech) 'to take', *kupit'* (Russian) – *koupit* (Czech) 'to buy', *získat* 'to acquire' (Czech). Perfective root verbs of this type are compatible with incremental adverbials like 'gradually,' as the Czech example (29) shows. ('The superscripts 'I' and 'P' stand for the imperfective and perfective aspect of a verb.) This suggests that such verbs cannot be assimilated to the class of Vendler's achievements, or Bach's momentaneous verbs.

(29) Trápící se Anglii postupně spasil^{P} kapitán Beckham. Czech
suffering England gradually saved captain Beckham
'Captain Beckham gradually rescued suffering England.'

Most importantly, combining such perfective verbs with expressions that generally negate upper bounds of events leads to a contradiction or is odd, as we see in (30) with the Czech verb *obléci (se)* 'to dress':

(30) Oblékl^{P} se, ??/*ale nezcela. Czech
dressed REFL ??/*but not.completely
'He dressed, but not completely.'

This behavior can be motivated if we assume that the semantic representation *obléci (se)* 'to dress' contains MAX_E and its requirement that the understood upper bound of the described event be reached clashes with *nezcela* 'not completely'. If MAX_E is a part of the semantic representation of a verb, then knowing its meaning includes the knowledge about how we conventionally package events described by it into single coherent wholes with initial, middle and end stages. For example, by virtue of knowing what a verb like 'dress' means, we also know that particular events of dressing may culminate with respect to putting just one piece of clothing on or with respect to several pieces of one outfit. What counts as the state of being completely dressed, the unique maximal event of dressing, widely varies with context, and therefore, the upper bound of the relevant scale with respect to which dressing events will count as maximal is left indeterminate in the semantic structure of 'dress.' The degrees of the scale can be thought of as measuring different degrees of being dressed, predicated of the 'dressee,' and its part structure is mapped into subevents of dressing. What distinguishes the Czech perfective verb *obléci (se)* from the English verb *to dress* is that the *perfective* verb *obléci (se)* 'to dress' requires that the described event is packaged as being maximal, otherwise its use is simply ungrammatical – and this applies in any situation, regardless of the variety of contextual factors.

Arguably, Slavic monomorphemic perfective verbs of this type would seem to qualify as Vendlerian accomplishments. If so, then their existence would have implications for cross-linguistic, and perhaps even universal, generalizations in the domain of telicity, because it would mean that accomplishment verb stems cannot be universally excluded, contrary to Kratzer's (2004) suggestion. If Germanic languages have no verb stems denoting accomplishments, as proposed by Kratzer (2004), and if Slavic languages do, as I argue, then their existence in Slavic languages would constitute one typological point of difference between these two language families.

We observe another interesting difference between Slavic and Germanic languages at the level of monomorphemic verbs. There are only a few Slavic root verbs that qualify as Vendler's achievements or Bach's momentaneous events: cp. *najtí* (Russian) – *najít* (Czech) 'to find', *vstretit'* (Russian) – *potkat* (Czech) 'to meet.' They are odd or unacceptable with incremental adverbials like 'gradually':

(31) Segodnya utrom (??/*postepenno) on našol^{P} na polu pugovicu. Russian
today morning (??/*gradually) he found on floor button.SG.ACC
'This morning, he (??/*gradually) found a/the/some button on the floor.'

Paradigm examples of English stem verbs denoting achievements are expressed by *derived* perfectives in Slavic languages. Some Czech examples are:

(32) IMPERFECTIVE BASE → DERIVED PERFECTIVE Czech
znát 'to know' *poznat* 'to recognize'
pozorovat 'to observe' *zpozorovat* 'to notice', 'to spot'
sahat 'to touch' *sáhnout* 'to touch (once)' → *dosáhnout* 'to reach'
jít 'to go' *přijít* 'to arrive', *odejít* 'to leave'

The perfective aspect of Slavic achievements has one grammatical reflex that sets them apart from English achievement verbs, which are not grammatically perfective: namely, they cannot shift from singular events into plural events when combined with indefinite plural or mass arguments. (33a) describes a single instantaneous event that is directed at a single object or a single collection of objects. In order to express a plurality of instantaneous events, the corresponding imperfective verb must be used, as we see in (33b).

(33) a. Našla^{P} mravence / smetí na dvorku *celý týden / za týden. Czech
found ants.SG/PL.ACC / dirt.SG.ACC in yard *whole week / in week
'She found ants / dirt in the yard in a week.' [inchoative reading, 'after a week']

b. Nacházela^{I} mravence / smetí na dvorku
found ants.SG/PL.ACC / dirt.SG.ACC in yard
celý týden / *za týden.
whole week / *in week
'She found ants in the yard for a week.'

This behavior can be motivated if we assume that Slavic underived verbs that denote achievements and are perfective are also interpreted by means of the operator MAX_E. It is MAX_E that effectively preempts a shift of such verbs into a plural interpretation, even when they are combined with plural or mass arguments. In contrast, in English, and other Germanic languages, such shifts of achievement verbs are possible, precisely because they are not grammatically perfective.

What is possibly problematic about this proposal is that singular achievement predicates generally denote sets of unordered singular events, and hence Slavic perfective verbs denoting achievements do not strictly satisfy the input of requirement of MAX_E, as specified in (1). However, it could still be proposed that they by default introduce MAX_E into the semantic structure of sentences; MAX_E would serve as a semantic correspondent of their syntactic behavior that they share with other perfective verbs, which is manifested in the co-occurrence restrictions with adverbials and the future auxiliary, for example. A somewhat similar situation might be seen as obtaining in the case of certain nouns that behave like count nouns in so far as they occur with an indefinite article, and yet provide no clear principle of count, identification and reidentification: cp. *he gave me quite a fright*. What we gain if we assume that monomorphemic perfective verbs denoting achievements contain MAX_E in their semantic representation is a one-to-one correspondence between perfectivity and maximality at the level of monomorphemic verbs. The cost of this solution might be justifiable, given that the class of monomorphemic achievements is small in Slavic languages, even smaller than the already quite restricted class of stem achievements in Germanic languages.

4.3 Telicity of derived verbs

In Slavic languages, the vast majority of perfective verbs are morphologically complex, and built by a variety of derivational means. Prefixation is among the most common means of deriving perfective verbs. This explains why prefixes take a center stage in Slavic telicity studies. Prefixes are taken to be the key element in the 'verb marking' strategy in the encoding of telicity in Slavic languages. Telicity of Slavic verbs is assumed to be predictably linked to a set of prefixes (cf. Verkuyl 1999, for example), or they phonologically spell out the head feature in the functional projection dedicated to telicity/perfectivity (cf. Borer 2005, for example). However, such claims are empirically problematic at best, and at worst, they make wrong predictions about the distribution and semantics of Slavic prefixes. For example, what is intractable, difficult to handle or even a priori excluded on such accounts is the possibility of prefixes being applied to perfective verbs, and stacking of multiple prefixes in the same verb (cf. Filip 2004).

I propose a novel hypothesis regarding the link between telicity, here understood as maximality, and Slavic prefixes: When applied to verb predicates at a lexical ('pre-functional') level, prefixes add meaning components that contribute to specifying a criterion for ordering of events in their denotation. In this way, prefixes contribute to licensing the application of MAX_E. Prefixes do not enforce the application of MAX_E, because a verb predicate formed with a prefix that specifies an ordering criterion on events can still be realized as an imperfective verb, which denotes non-maximal events.

The proposal that prefixes contribute to specifying the criterion for ordering of events is straightforwardly related to their rich lexical meanings and their frequent uses in which they imply directed path structures in a variety of event dimensions.

Many prefixes historically developed from prepositions and adverbs used for the expression of directed path structures in space and time. Other meanings commonly lexicalized by prefixes are related to cardinality and measure. Directed path structures, cardinality and measurement notions are precisely the type of meaning components that have independently been uniformly represented by means of scales.

Prefixes related to measure meanings like 'relatively large/small quantity of x' were discussed in Filip (2000, 2005a,b), and, therefore, I will not address them here. It is also important to emphasize that verb prefixes in Slavic languages may have other meanings in addition to those related to directed path structures, and some prefixes have uses that are unrelated to directed path structures in any event dimension. What prefixes never express are proportional notions that characterize strong quantification, as I propose (cf. Filip 2005b).

The proposal has two main consequences. First, from the perspective of the construction of telic predicates, the uses of Slavic prefixes that contribute to the specification of the ordering criterion on events can be assimilated to the class of scale inducing expressions, and treated on a par with the *Goal-PP* and the *result XP* in English, for example, as well as with German and Dutch prefixes expressing directed path structures in a variety of event dimensions. Second, Slavic prefixes are not classified as elements of the functional structure, i.e., they do not phonologically spell out the head in the functional structure dedicated to 'perfectivity' or 'telicity'. This also means that the crucial difference in the encoding of telicity in Slavic vs. Germanic languages cannot lie at the level of representation at which prefixes originate.

As observed above, the vast majority of monomorphemic verbs in Slavic languages are formally imperfective and semantically non-maximal. Most of them belong neither to the incremental nor scalar class. They have sets of unordered eventualities in their denotation and lexically specify only qualitative conditions for their application. For example, by virtue of knowing the meaning of a process verb like *sleep* we know what states of affairs in the world count as eventualities of sleeping, but not what counts as a single countable, or *maximal*, eventuality of sleeping. As I here argue, events are maximal with respect to some ordering criterion. In Slavic languages, its specification commonly relies on verb prefixes. One among several prefixes that can be attached to the verb stem meaning 'sleep' in Czech is the terminative prefix *do-* (here glossed as TERM) and the combination can be realized in the perfective verb *dospal* meaning roughly 'he finished sleeping,' as in (34):

(34) Tak jsem si malinko po.spal^{P}, abych **do.spal^{P}** ten
so AUX.BE REFL.DAT a.little ATTN.slept.1SG so.that TERM.slept.1SG this
spánkový deficit. Czech
sleep deficit
'So I slept a little / took a nap in order to catch up on my sleep deficit.'

Do- is here related to its basic spatial directional meaning of '(in)to,' implying a directed path and its upper bound. The entity it is predicated of is expressed by the direct object of the *do*-verb. The lexical filler of the direct object slot fleshes out the

details of the scale implied by the prefix. Since it is 'sleep deficit' in (34), the scale in question is naturally taken to be a temporal one, and its upper bound set by the state in which all the sleeping deficit is eliminated by sleeping for a certain amount of time. That chunk of sleeping then counts as the largest unique event of sleeping at a given situation.

The observation that the path structure or scale implied by the verb's prefix is predicated of the referent of the verb's direct object motivates the tendency for Slavic prefixed verbs to be transitive. However, the scale implied by a prefix may be predicated of an entity that is not overtly expressed; it may be recovered from the context, as we see with *pospal* 'slept a little' in (34), which is derived with the prefix *po-*, and which here contributes the meaning of a relatively small quantity or measure (glossed with ATN standing for 'attenuative'). Prefixed verbs that are intransitive are common, and they also commonly denote maximal events: cp. Czech *zakašlat* (pf.) 'to cough once,' 'to make a coughing sound.'

So far nothing would prevent us from proposing that prefixes not only introduce the ordering criterion on events, but are also overt exponents of MAX_E. Such a proposal is invalidated by the contrast in (35a) and (35b), and specifically by the existence of prefixed imperfective verbs (35b). The prefix *do-* is attached to the verb stem meaning 'write,' a strictly incremental verb stem, to which it contributes the terminative (glossed as TERM) meaning. The prefix *do-* forms the perfective verb in (35a) and also the secondary imperfective verb in (35b) derived from it by imperfectivizing suffixation, which is the main difference between (35a) and (35b).

(35) a. Mozart **do**.psal[P] poslední takty Don Giovanniho na Bertramce
Mozart TERM.wrote.3SG last notes D.G.SG.GEN on B.
*týden / za týden. Czech
*for a week / in a week
'Mozart finished composing the last notes of D.G. in the villa Bertramka in a week.'

b. Mozart **do**.pis.ova.l[I] poslední takty Don Giovanniho na
Mozart TERM.write.IPF.PAST.3SG last notes D.G.SG.GEN on
Bertramce týden / *za týden.
B. for a week / *in a week
'Mozart spent a week finishing the last notes of D.G. in the villa Bertramka.'

In both (35a) and (35b), the use of *do-* is clearly related to its basic spatial directional meaning of '(in)to,' and refers to the endpoint of some implied directed path structure, whose details are spelled out by the scale lexically associated with the Incremental Theme argument 'last notes of Don Giovanni.' Hence, the ordering criterion comes from the scale that is jointly specified by the Incremental Theme argument and the directed path structure implied by the prefix *do-*. Both the sentences denote events that are partially ordered with respect to this scale and its upper bound. Although (35a) and (35b) satisfy the input requirement of MAX_E, it is only the perfective verb that entails that the upper bound of the implied scale was reached, i.e., all the score parts

of Don Giovanni were composed. That this is an entailment of (35a) can be shown by the fact that (35a) cannot be followed by '. . . but he still continued finishing Don Giovanni on his return to Vienna' without a contradiction. In contrast, (35b) with the imperfective verb can be continued in this way, because it entails that only *some* of the last scores of Don Giovanni were written, but the possibility of *all* of them being written may merely be conversationally implicated. This can be straightforwardly captured if we assume that only the perfective verb has MAX_E in its logical representation, while the imperfective verb in (35b) lacks it. Implicit in this proposal is the traditional Jakobsonian view on which perfectivity is the marked category in the privative aspectual opposition, and imperfectivity unmarked.

(35a) and (35b) illustrate one of the common patterns of minimal aspectual pairs in Slavic languages, and it illustrates how prefixes typically interact with aspectually marked perfective and imperfective verbs. First, (35b) shows that Slavic verb prefixes are not systematically linked to perfectivity of verbs, due to the simple distributional fact that they occur in secondary imperfective verbs.

Second, and related to the first point, the maximalization operator MAX_E cannot be introduced by a prefix, because prefixes form secondary imperfective verbs that lack the maximalization requirement. To this it could be objected that prefixes are overt exponents of MAX_E, or telic operators, but the higher imperfective ('atelicity') operator introduced by the imperfective suffix overrides or undoes the effect of the 'lower' MAX_E. (This would be in the spirit of Kratzer's 2004 suggestion, for example.) However, there are compelling arguments based on the constraints on the internal coherence of morphological systems that prohibit this solution (cf. Filip 2000, and elsewhere).

Third, MAX_E ('culmination requirement') and the partial order of events which is induced by information coming from a prefix ('culmination condition') are clearly separate. The separation is formally encoded by secondary imperfectives: Predications with secondary imperfectives like *dopisoval* 'he finished/was finishing writing' have sets of partially ordered events in their denotation, due to the contribution of the prefix, but the imperfective suffix on the verb explicitly suspends the requirement that the verb only has maximal events in its denotation, i.e., the imperfective suffix suspends the application of the maximalization operator MAX_E at the level of the denotation of the verb's meaning.

Based on such observations, we can conclude that prefixes are not overt exponents of the maximalization operator MAX_E, but instead MAX_E is grammaticized by (fully formed) verbs that are perfective. The examination of the whole class of perfective verbs also leads to the conclusion that MAX_E is a covert operator, because there is no single affix on a verb or morphological operation that would in all of its occurrences systematically encode the maximality of a verb. The semelfactive suffix that derives perfective verbs might seem to be one plausible candidate for this job, but its use is rather restricted and lexically idiosyncratic.

We have seen an example of how a strictly incremental verb interacts with a prefix whose meaning contributes to specifying the ordering criterion on events. In what follows, let us consider the interaction of prefixes with scalar predicates. The grammar of Slavic languages allows us to derive perfective or imperfective verbs from root adjectives that

are scalar. In general, a perfective verb derived from a scalar adjective will systematically require that events in its denotation be maximal, even if it is derived from an open scale adjective, otherwise the use of such a verb is ungrammatical. This means that the upper bound of a scale lexically associated with the open scale root adjective must be supplied from the context. Conversely, an imperfective verb derived from a scalar adjective will suspend the maximalization requirement, even if it is derived form a closed scale root adjectives. It is ultimately the grammatical aspect of a fully formed verb derived from a given root adjective, open or closed scale, which determines whether the events described by it are enforced to be maximal in all of the verb's occurrences.

(36) contains three scalar verbs, all derived from the closed scale adjective 'empty.' All the three verbs in (36) have in common that they denote sets of events that are ordered with respect to the property scale introduced by their adjective root 'empty,' which is predicated of the referent of their Theme argument.

(36) *scalar verb derived from a closed-scale gradable adjective* Czech

a. adjective → imperfective V → perfective V →
prázdný prázdnit^{I} vy.prázdnit^{P}
empty.ADJ empty.INF DIR/COMPL.empty.INF
'empty' 'to (be) empty(ing)' 'to empty'

secondary imperf V
vy.prazdňovat^{I}
DIR/COMPL.empty.IPF.INF
'to (be) empty(ing)'

b. Vyprázdnila^{P} jsem zásuvku, (?)ale ne úplně / *hodinu /
'I emptied the drawer, (?)but not completely / *for an hour /
za hodinu.
in an hour.'

When added to the imperfective base *prázdnit* 'to (be) emptying' or 'to remove/be removing *x* (Content) from *y* (Source),' the prefix *vy-* mainly contributes the directional meaning of 'from' or 'out of,' which presupposes the existence of a directed path. The meaning of the prefix *vy-* overlaps with the semantic components lexicalized in its base. Among these three scalar verbs, it is only the perfective verb that requires that events in its denotation be maximalized with respect to the scale and its upper bound they all lexicalize. The contrast between the perfective verb, on the one hand, and the two imperfective verbs derived from the closed scale adjective 'empty', on the other hand, suggests that MAX_E is associated with the perfective aspect of the verb *vyprázdnit* 'to empty', rather than with the prefix *vy-*. The prefix *vy-* occurs on the secondary imperfective verb *vyprazdňovat* 'to (be) empty(ing)' that has no maximalization requirement.

Slavic secondary imperfective verbs like *vyprazdňovat* 'to (be) empty(ing) confirm the generalization in (17), stated in connection with the English data like (16a–c): namely, the presence of a closed scale in the semantic structure of a sentence does not guarantee its maximality (telicity). They are built from gradable closed scale adjectives

that entail the existence of the maximal degree of the closed property scale, but their imperfective suffix explicitly suspends the maximalization requirement that it be reached.

In this connection we may mention that events described by the perfective verb *vyprázdnit* 'to empty' will normally be maximalized relative to the standard maximal degree of the closed scale lexically associated with its root adjective 'empty.' Ordinarily, it will generate the assertion that the referent of the Source argument possess the maximal degree of the 'empty' property. However, the context may reset its value to some relatively low non-zero degree, and it is with respect to the shifted value that events in the denotation of such perfective verbs count as maximal. Native speakers agree that (36) is felicitous just in case the described event is thought of as having reached what counts as the contextually determined maximal degree, even if it is not the absolute standard maximal degree, on the scale evoked by the adjective root 'empty.' For this reason, a sentence like (36b) does not contradict the claim that perfective verbs like *vyprázdnit* 'to empty' contain the maximalization operator MAX_E in their semantic structure, but rather it can be used to support it.

(37) contains three verbs derived from the adjective *krátký* 'short,' following the same derivational pattern illustrated by (36a) above. Formally, the perfective verb *zkrátil* 'he shortened' in (37b) minimally differs from the simple imperfective verb *krátil* 'he shortened/was shorening' in (37a) by the prefix *z-*. Its contribution to verbs derived from scalar adjectives is described as 'to provide with the property described by the root adjective' in standard reference grammar books (cf. Petr et al 1986).

(37) *scalar verb derived from an open scale gradable adjective* Czech

a. Krejčí mi krátil^{I}/ z.kracoval^{I}
tailor.NOM.SG me.DAT shortened / PREF.shorten.IPF.PAST.3SG
kalhoty.
pants.PL.ACC
i. 'The tailor shortened my pants.'
ii. 'The tailor was shortening my pants.'

b. Krejčí mi z.krátil^{P} kalhoty.
tailor.NOM.SG me.DAT PREF.shortened pants.PL.ACC
'The tailor shortened my pants.' [and finished shortening them]

The use of the perfective sentence (37b) is felicitous, just in case it is clear from the context that a certain change in the length of my pants was made, which counts as *the* maximal change in that context. Continuing (37b) with '. . . but the tailor did not finish shortening my pants' leads to a blatant contradiction. In contrast, (37a) can be continued in this way, because its head imperfective verb is non-maximal. At the same time, (37a) can easily shift into a maximal interpretation, in an appropriate linguistic or extra-linguistic context. The requirement to 'maximalize' events in the denotation of a perfective verb, and the lack of this requirement associated with the two imperfective verbs is consistent with the view that the perfective aspect constitute the marked

member in the aspectual opposition. Again, we see that the prefix on a secondary imperfective verb, here *zkracoval* 'he shortened' / 'he was shortening', does not enforce the maximalization operation on the ordered set of events in its denotation, which is here taken to support the argument that a prefix is not an overt exponent of MAX_E. From this it also follows that MAX_E is a covert operator in the prefixed perfective verb *zkrátil* 'he shortened'.

4.4 Telicity at the VP level

The proposal that the maximalization operator MAX_E is grammaticized in perfective verbs, the marked members in the privative aspectual opposition, together with general principles that govern markedness and type-shifting, makes strong predictions about the way in which they interact with the syntax and semantics of sentences which they head. In general, lexical items that are grammatically marked with respect to a given distinction do not easily undergo a shift in meaning, without an additional change in formal marking (cf. Partee 1999). It is, therefore, to be expected that no lexical material in a sentence can override the maximality/telicity requirement of a perfective verb and shift it into a non-maximal/atelic interpretation.

This prediction is confirmed by the observation that a perfective verb that has MAX_E in its semantic structure enforces the maximality/telicity of all its projections, and the semantic properties of constituents that co-occur with a MAX_E-verb in the same sentence must be compatible with its maximalization requirement, or shift interpretation in cases of conflicts. This in turn has consequences for the different role that the direct object and modifiers play in constructing telic verb phrases in Slavic languages than they do in Germanic ones. Since the maximality/telicity of a sentence is determined before the perfective MAX_E-verb is composed with its nominal arguments, it is predicted that it may constrain the interpretation of its arguments, but not vice versa. The most well-known data that confirm this prediction involve the influence of perfective verbs on the interpretation of their bare mass and plural arguments. Wierzbicka's (1967) Polish examples are given in (38):

(38) a. On z.jadł^{P} kaszę / oliwki. Polish
he.NOM PREF.ate porridge.SG.ACC / olives.PL.ACC
'He ate (up) (all) the porridge / olives.' (i.e., the whole quantity of porridge / olives)

b. On jadł^{I} kaszę / oliwki.
he.NOM ate porridge.SG.ACC / olives.PL.ACC
i. 'He was eating (sm/∅/the) porridge / olives.'
'He was eating some of the porridge / olives.'
ii. 'He ate (sm/∅/the) porridge / olives.'

The main difference between (38a) and (38b) amounts to the aspect of their main verb, and this aspectual difference is correlated with a clear difference in the interpretation of their bare direct object arguments: With the perfective verb in (38b), but not with the imperfective verb (38a), they naturally refer to "one object (a certain, definite, group of objects – the olives)" (Wierzbicka 1967, p. 2238), and it is also entailed that the totality of this object was subjected to the event of eating (see also Wierzbicka 1967). The interpretation of 'olives' and 'porridge' in the perfective sentence above comes close to the interpretation of English NP's with the definite article *the* understood as referential definites, in combination with some totality expression like *whole, entire* or *all*. An imperfective verb does not constrain the interpretation of its direct object arguments, and they can have a kind, a weak indefinite (existential), and also a definite interpretation, depending on the context.

Building on the previous accounts of Krifka (1986) and Filip (1993, 1999, 2005b), the constraint on the interpretation of bare mass and plural arguments in the perfective sentence follows, assuming that (i) the perfective verb has MAX_E in its semantic structure and (ii) the arguments in question stand in the (Strictly) Incremental Theme relation to it. The object-event homomorphism requires that the (Strictly) Incremental Theme argument refer to some unique maximal entity at a given situation, which effectively amounts to the perfective verb restricting the type of the (Strictly) Incremental Theme argument to the argumental type *e*. Since mass and plural nominal arguments are inherently of the predicative type $\langle e,t\rangle$, they can only serve as (Strictly) Incremental Theme arguments of a perfective verb after a type-shift to the appropriate argumental type *e*. This is done by means of the σ-operator that is standardly used to represent totalities of stuff and plural entities in the denotation of nominal predicates. It shifts a common noun like the Polish *oliwki* 'olives' from its basic meaning **olives'** of the type $\langle e,t\rangle$ to the maximal interpretation σ*x.**olives'**(x) '(all) the olives' of the type *e*. The maximal interpretation of inherently mass and plural predicates amounts to their referentially specific interpretation, assuming that the sigma operator is taken to interpret referentially specific NP's/DP's with the definite article like *the* in English, for example. I also propose that the σ-operator is introduced into a logical representation of perfective verbs that specify a (Strictly) Incremental relation, as a local default operator over the variable introduced by a (Strictly) Incremental Theme argument, and which binds it just in case there is no other operator or quantifier that could bind it. This makes sense given that the maximal interpretation of the (Strictly) Incremental Theme argument directly follows from the lexical and aspectual properties of its governing perfective verb, and nothing else.

This does not imply, as I emphasized elsewhere, that there is a direct and systematic link between perfectivity and definiteness, or that the perfective aspect in Slavic languages takes on the functionality of the definite article, which Slavic languages lack (with the exception of Bulgarian and Macedonian). The claim is that a perfective verb imposes a maximality requirement on its (Strictly) Incremental Theme argument, just in case it is in a referential position, i.e., not in the scope of any operator or quantifier. If the argument is realized by a bare mass or a bare plural noun, its maximal interpretation leads to its referentially specific interpretation, because this is the only maximal

interpretation available for bare mass and plural nouns. Singular count nouns and quantified *DP*'s saturating the (Strictly) Incremental Theme argument of a perfective verb are also constrained to have the maximal interpretation, but not a referentially specific interpretation. Arguments that are not (Strictly) Incremental Themes are not constrained by a perfective verb to be interpreted as maximal.

Imperfective verbs and the phrases they project up to the *IP* level may contain lexical material that specifies an ordering criterion for the application of predicates they express. This is illustrated by examples like (35b). However, verbal expressions headed by imperfective verbs are grammatically non-maximal, and any maximality effects we observe in imperfective sentences due to their linguistic context of use as well as world knowledge.

5. Conclusion

Hypothesizing that telicity in natural languages fundamentally relies on the maximalization operation on a set of ordered events, the analysis of telicity proposed here emphasizes the centrality of a measuring scale, which imposes the requisite ordering on events. On one side of the telicity continuum, we find monomorphemic verbs that entail telicity, i.e., only have maximal events in their denotation in all their occurrences, and project telic verb phrases and sentences. A case in point are Slavic languages in which such verbs are systematically realized as grammatically perfective. However, the class of such verbs is rather small, in Slavic languages and cross-linguistically. Germanic languages lack verbs of this type, and all expressions at the level of the *V* category are atelic, i.e., unmarked for maximality. On the other side of the continuum, we find monomorphemic verbs that denote sets of unordered events, that are non-scalar and contain no measurement (quantitative) criteria for their application. Such verbs are unmarked for telicity, they only specify qualitative criteria for their application, and cannot on their own describe maximal events. They comprise the vast majority of monomorphemic verbs in Germanic and Slavic languages. In Slavic languages, they are systematically realized as grammatically imperfective. Virtually any atelic monomorphemic predicate may serve as a basic building bloc for a complex predicate that is telic. It follows then that the vast majority of telic predicates in Germanic and Slavic languages is constructed by morphological or syntactic means.

The differences in the encoding of telicity that we observe in these languages follow as a consequence from the way in which basic components of meanings related to an abstract representation of measurement, i.e., a scale, are encoded in these languages, and specifically to what extent they are encoded by verb-internal means vs. verb-external means. In Slavic languages, MAX_E is grammaticized in perfective verbs, which have maximal events in their denotation based on the ordering criterion incorporated into the verb. The maximalization operator MAX_E is a covert operator in both Slavic and Germanic languages. They do not parametrically differ in the grammaticalization sources for the expression of telicity, with Germanic languages taken to exploit the 'object-encoding' strategy and Slavic languages the 'verb-encoding' strategy (by verb prefixes). While in Slavic languages telicity viewed as maximalization on events is an entailment of perfective verbs, in Germanic languages, what counts as a maximal event in the denotation of a given telic predicate is often not entailed by it, all verbs and a large number of *VP*'s are inherently unmarked with respect to telicity/maximality and shift into telic/maximal interpretations in appropriate linguistic contexts, or their telicity/maximality is inferred by a conversational implicature.

Acknowledgements

I would like to thank Susan Rothstein and Malka Rappaport Hovav for many helpful discussions. This paper also greatly benefited from the suggestions of the audience at the Workshop on *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*, organized by Susan Rothstein, Bar-Ilan University, Ramat Gan, Israel, in June 2005. Last but not least, my thanks go to two anonymous reviewers whose critical suggestions were essential in guiding the final revisions of this paper.

References

Bach, E. 1981. On time, tense, and aspect: An essay in English metaphysics. In *Radical Pragmatics*, P. Cole (ed.), 63–81. New York NY: Academic Press.

Bach, E. 1986. The algebra of events. *Linguistics and Philosophy* 9: 5–16.

Bartsch, R. 1995. *Situations, Tense and Aspect. Dynamic Discourse Ontology and the Semantic Flexibility of Temporal System in German and English*. Berlin: Mouton de Gruyter.

Borer, H. 2005. *Structuring Sense*. Oxford: OUP.

Carlson, G.N. 1977. A unified analysis of the English bare plural. *Linguistics and Philosophy* 1: 413–58.

Carlson, G.N. 1984. Thematic roles and their role in semantic interpretation. *Linguistics* 22: 259–279.

Chierchia, G. 1995. Individual-level predicates as inherent generics. In *The Generic Book*, G.N. Carlson & F.J. Pelletier (eds.), 176–223. Chicago IL: The University of Chicago Press.

Comrie, B. 1976. *Aspect. An Introduction to the Study of Verbal Aspect and Related Problems*. Cambridge: CUP.

Declerck, R. 1979. Aspect and the bounded/unbounded (telic/atelic) distinction. *Linguistics* 17: 761–94.

Dekker, P. 2004. Cases, adverbs, situations, and events. In *Context Dependence in the Analysis of Linguistic Meaning*, H. Kamp & B.H. Partee (eds.), 383–404. Amsterdam: Elsevier.

Dowty, D. 1979. *Word Meaning and Montague Grammar. The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Dordrecht: Reidel.
Dowty, D. 1987. Thematic proto-roles, subject selection, and lexical semantic defaults. Paper presented at the 1987 LSA Annual Meeting. San Francisco.
Dowty, D. 1991. Thematic proto-roles and argument selection. *Language* 67: 547–619.
Filip, H. 1990. Thematic roles and Aktionsart. In *Proceedings of the Western Conference on Linguistics (WECOL) 20*, B. Birch, K. Hunt & V. Samiian (eds.), 88–99. Fresno CA: California State University.
Filip, H. 1993. Aspect, Situation Types and Noun Phrase Semantics. PhD dissertation, University of California at Berkeley.
Filip, H. 1999. *Aspect, Eventuality Types, and Noun Phrase Semantics*. London: Routledge.
Filip, H. 2000. The quantization puzzle. In *Events as Grammatical Objects, from the Combined Perspectives of Lexical Semantics, Logical Semantics and Syntax*, J. Pustejovsky & C. Tenny (eds.), 3–60. Stanford CA: CSLI.
Filip, H. 2004. Prefixes and the delimitation of events. *Journal of Slavic Linguistics* 12: 55–101.
Filip, H. 2005a. Measures and indefinites. In *Reference and Quantification: The Partee Effect. Festschrift for Barbara Hall Partee*, G.N. Carlson & F.J. Pelletier (eds.), 229–288. Stanford CA: CSLI.
Filip, H. 2005b. The telicity parameter revisited. *Semantics and Linguistic Theory (SALT) XIV*, 92–109. Ithaca NY: CLC Publications.
Filip, H. & Carlson, G.N. 2001. Distributivity strengthens reciprocity and collectivity weakens it. *Linguistics and Philosophy* 24: 417–466.
Filip, H. & Rothstein, S. 2005. Telicity as a semantic parameter. In *Formal Approaches to Slavic Linguistics* 14: *The Princeton Meeting*, J. Lavine, S. Franks, H. Filip & M. Tasseva-Kurktchieva (eds.), 139–156. Ann Arbor MI: Michigan Slavic Publications.
Fillmore, C. 1986. Pragmatically controlled zero anaphora. In *Proceedings of the 12th Annual Meeting of the Berkeley Linguistics Society*, V. Nikiforidou et al. (eds.), 95–107.
Forsyth, J. 1970. *A Grammar of Aspect. Usage and Meaning in the Russian Verb*. Cambridge: CUP.
Gazdar, G. 1979. *Pragmatics: Implicature, Presupposition, and Logical Form*. New York NY: Academic Press.
Goldberg, A.E. 1992/1995. Argument Structure Constructions. PhD dissertation. University of California at Berkeley. (Published by the University of Chicago Press, 1995).
Grice, H.P. 1967. Logic and conversation. The William James Lectures given at Harvard in the spring, then as a seminar at Berkeley in the fall.
Grice, H.P. 1975. Logic and conversation. In *Syntax and Semantics* Vol. 3. *Speech Acts*, P. Cole & J.L. Morgan (eds.), 41–58. New York NY: Academic Press. (Also in *Pragmatics: A reader*, S. Davis (ed.), 305–315. NY: Oxford University Press, 1991).
Hale, K. & Keyser, S.J. 1993. On argument structure and the lexical expression of syntactic relations. In *The View from Building 20*, K. Hale & S.J. Keyser (eds.), 53–109. Cambridge MA: The MIT Press.
Hay, J., Kennedy, C. & Levin, B. 1999. Scale structure underlies telicity in 'degree achievements'. *Semantics and Linguistic Theory (SALT)* IX, 127–144. Ithaca NY: CLC Publications.
Horn, L. 1972. *On the Semantic Properties of the Logical Operators in English*. Bloomington IN: Indiana University Linguistics Club.
Isačenko, A.V. 1962. *Die russische Sprache der Gegenwart*, Part I, *Formenlehre*. Halle, Saale: Niemeyer.

Jackendoff, R. 1996. The proper treatment of measuring out, telicity, and perhaps even quantification in English. *Natural Language and Linguistic Theory* 14(2): 305–354.
Kearns, K. 2007. Telic senses of deadjectival verbs. *Lingua* 117: 26–66.
Kennedy, C. To appear. Vagueness and grammar: The semantics of relative and absolute gradable predicates. *Linguistics and Philosophy*.
Kennedy, Ch. 2005. Comparatives, semantics of. In *Lexical and Logical Semantics*, section of the *Encyclopedia of Language and Linguistics*, 2nd ed, Allen, K. (ed.), Oxford: Elsevier.
Kratzer, A. 1990. How specific is a fact? In *Proceedings of the 1990 Conference on Theories of Partial Information*. Austin TX: Center for Cognitive Science and College of Liberal Arts.
Kratzer, A. 2003. The Event Argument and the Semantics of Verbs. Ms, University of Massachusetts at Amherst.
Kratzer, A. 2004. Telicity and the meaning of objective case. In *The Syntax of Time*, J. Guéron & J. Lecarme (eds.), 389–424. Cambridge MA: The MIT Press.
Krifka, M. 1986. Nominalreferenz und Zeitkonstitution. Zur Semantik von Massentermen, Individualtermen, Aspektklassen. PhD dissertation, The University of Munich, Germany.
Krifka M. 1989. Nominal reference, temporal constitution and quantification in event semantics. In *Semantics and contextual expressions*, R. Bartsch, J. van Bentham & Peter van Emde Boas (eds.), 75–155. Dordrecht: Foris.
Krifka, M. 1992. Thematic relations as links between nominal reference and temporal constitution. In *Lexical Matters*, I.A. Sag & A. Szabolcsi (eds.), 29–53. Stanford CA: CSLI.
Krifka, M. 1998. The origins of telicity. In *Events and Grammar*, S. Rothstein (ed.), 197–235. Dordrecht: Kluwer.
Landman, F. 1992. The progressive. *Natural Language Semantics* 1: 1–32.
Landman, F. 1998. Plurals and maximalization. In *Events and Grammar*, S. Rothstein (ed.), 237–271. Dordrecht: Kluwer.
Landman, F. 2007. 1066: On the differences between the tense-perspective-aspect systems of English and Dutch. 107-166.
Larson, R.K. 1988. Implicit arguments in situation semantics. *Linguistics and Philosophy* 11: 169–201.
Levin, B. & Rappaport Hovav, M. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge MA: The MIT Press.
Levin, B. & Rappaport Hovav, M. 2005. *Argument Realization*. Cambridge: Cambridge University Press.
Levinson, S.C. 1984. *Pragmatics*. Cambridge: CUP.
Link, G. 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. In *Meaning, use and interpretation*, R. Baüerle, C. Schwarze & A. von Stechow (eds.), 303–323. Berlin: Walter de Gruyter. (Reprinted in *Formal Semantics: The Essential Readings*, P. Portner & B. Partee (eds.), 127–146. Oxford: Blackwell. 2002).
Link, G. 1987. Algebraic semantics of event structures. In *Proceedings of the Sixth Amsterdam Colloquium*, J. Groenendijk, M. Stokhof & F. Veltman (eds.), 243–272. Amsterdam: ITLI, University of Amsterdam.
Marantz, A. 1984. *On the Nature of Grammatical Relations*. Cambridge MA: The MIT Press.
Moens, M. & Steedman, M. 1988. Temporal ontology and temporal reference. *Computational Linguistics* 14: 15–28.
Mourelatos, A.P.D. 1978. Events, processes and states. *Linguistics and Philosophy* 2: 415–434. (Reprinted in *Syntax and Semantics* 14. *Tense and Aspect*, P.L. Tedeschi & A. Zaenen (eds.), 191–212. New York NY: Academic Press. 1981).

Dowty, D. 1979. *Word Meaning and Montague Grammar. The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Dordrecht: Reidel.
Dowty, D. 1987. Thematic proto-roles, subject selection, and lexical semantic defaults. Paper presented at the 1987 LSA Annual Meeting. San Francisco.
Dowty, D. 1991. Thematic proto-roles and argument selection. *Language* 67: 547–619.
Filip, H. 1990. Thematic roles and Aktionsart. In *Proceedings of the Western Conference on Linguistics (WECOL) 20*, B. Birch, K. Hunt & V. Samiian (eds.), 88–99. Fresno CA: California State University.
Filip, H. 1993. Aspect, Situation Types and Noun Phrase Semantics. PhD dissertation, University of California at Berkeley.
Filip, H. 1999. *Aspect, Eventuality Types, and Noun Phrase Semantics*. London: Routledge.
Filip, H. 2000. The quantization puzzle. In *Events as Grammatical Objects, from the Combined Perspectives of Lexical Semantics, Logical Semantics and Syntax*, J. Pustejovsky & C. Tenny (eds.), 3–60. Stanford CA: CSLI.
Filip, H. 2004. Prefixes and the delimitation of events. *Journal of Slavic Linguistics* 12: 55–101.
Filip, H. 2005a. Measures and indefinites. In *Reference and Quantification: The Partee Effect. Festschrift for Barbara Hall Partee*, G.N. Carlson & F.J. Pelletier (eds.), 229–288. Stanford CA: CSLI.
Filip, H. 2005b. The telicity parameter revisited. *Semantics and Linguistic Theory (SALT) XIV*, 92–109. Ithaca NY: CLC Publications.
Filip, H. & Carlson, G.N. 2001. Distributivity strengthens reciprocity and collectivity weakens it. *Linguistics and Philosophy* 24: 417–466.
Filip, H. & Rothstein, S. 2005. Telicity as a semantic parameter. In *Formal Approaches to Slavic Linguistics* 14: *The Princeton Meeting*, J. Lavine, S. Franks, H. Filip & M. Tasseva-Kurktchieva (eds.), 139–156. Ann Arbor MI: Michigan Slavic Publications.
Fillmore, C. 1986. Pragmatically controlled zero anaphora. In *Proceedings of the 12th Annual Meeting of the Berkeley Linguistics Society*, V. Nikiforidou et al. (eds.), 95–107.
Forsyth, J. 1970. *A Grammar of Aspect. Usage and Meaning in the Russian Verb*. Cambridge: CUP.
Gazdar, G. 1979. *Pragmatics: Implicature, Presupposition, and Logical Form*. New York NY: Academic Press.
Goldberg, A.E. 1992/1995. Argument Structure Constructions. PhD dissertation. University of California at Berkeley. (Published by the University of Chicago Press, 1995).
Grice, H.P. 1967. Logic and conversation. The William James Lectures given at Harvard in the spring, then as a seminar at Berkeley in the fall.
Grice, H.P. 1975. Logic and conversation. In *Syntax and Semantics* Vol. 3. *Speech Acts*, P. Cole & J.L. Morgan (eds.), 41–58. New York NY: Academic Press. (Also in *Pragmatics: A reader*, S. Davis (ed.), 305–315. NY: Oxford University Press, 1991).
Hale, K. & Keyser, S.J. 1993. On argument structure and the lexical expression of syntactic relations. In *The View from Building 20*, K. Hale & S.J. Keyser (eds.), 53–109. Cambridge MA: The MIT Press.
Hay, J., Kennedy, C. & Levin, B. 1999. Scale structure underlies telicity in 'degree achievements'. *Semantics and Linguistic Theory (SALT)* IX, 127–144. Ithaca NY: CLC Publications.
Horn, L. 1972. *On the Semantic Properties of the Logical Operators in English*. Bloomington IN: Indiana University Linguistics Club.
Isačenko, A.V. 1962. *Die russische Sprache der Gegenwart*, Part I, *Formenlehre*. Halle, Saale: Niemeyer.

Jackendoff, R. 1996. The proper treatment of measuring out, telicity, and perhaps even quantification in English. *Natural Language and Linguistic Theory* 14(2): 305–354.
Kearns, K. 2007. Telic senses of deadjectival verbs. *Lingua* 117: 26–66.
Kennedy, C. To appear. Vagueness and grammar: The semantics of relative and absolute gradable predicates. *Linguistics and Philosophy*.
Kennedy, Ch. 2005. Comparatives, semantics of. In *Lexical and Logical Semantics*, section of the *Encyclopedia of Language and Linguistics*, 2nd ed, Allen, K. (ed.), Oxford: Elsevier.
Kratzer, A. 1990. How specific is a fact? In *Proceedings of the 1990 Conference on Theories of Partial Information*. Austin TX: Center for Cognitive Science and College of Liberal Arts.
Kratzer, A. 2003. The Event Argument and the Semantics of Verbs. Ms, University of Massachusetts at Amherst.
Kratzer, A. 2004. Telicity and the meaning of objective case. In *The Syntax of Time*, J. Guéron & J. Lecarme (eds.), 389–424. Cambridge MA: The MIT Press.
Krifka, M. 1986. Nominalreferenz und Zeitkonstitution. Zur Semantik von Massentermen, Individualtermen, Aspektklassen. PhD dissertation, The University of Munich, Germany.
Krifka M. 1989. Nominal reference, temporal constitution and quantification in event semantics. In *Semantics and contextual expressions*, R. Bartsch, J. van Bentham & Peter van Emde Boas (eds.), 75–155. Dordrecht: Foris.
Krifka, M. 1992. Thematic relations as links between nominal reference and temporal constitution. In *Lexical Matters*, I.A. Sag & A. Szabolcsi (eds.), 29–53. Stanford CA: CSLI.
Krifka, M. 1998. The origins of telicity. In *Events and Grammar*, S. Rothstein (ed.), 197–235. Dordrecht: Kluwer.
Landman, F. 1992. The progressive. *Natural Language Semantics* 1: 1–32.
Landman, F. 1998. Plurals and maximalization. In *Events and Grammar*, S. Rothstein (ed.), 237–271. Dordrecht: Kluwer.
Landman, F. 2007. 1066: On the differences between the tense-perspective-aspect systems of English and Dutch. 107-166.
Larson, R.K. 1988. Implicit arguments in situation semantics. *Linguistics and Philosophy* 11: 169–201.
Levin, B. & Rappaport Hovav, M. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge MA: The MIT Press.
Levin, B. & Rappaport Hovav, M. 2005. *Argument Realization*. Cambridge: Cambridge University Press.
Levinson, S.C. 1984. *Pragmatics*. Cambridge: CUP.
Link, G. 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. In *Meaning, use and interpretation*, R. Baüerle, C. Schwarze & A. von Stechow (eds.), 303–323. Berlin: Walter de Gruyter. (Reprinted in *Formal Semantics: The Essential Readings*, P. Portner & B. Partee (eds.), 127–146. Oxford: Blackwell. 2002).
Link, G. 1987. Algebraic semantics of event structures. In *Proceedings of the Sixth Amsterdam Colloquium*, J. Groenendijk, M. Stokhof & F. Veltman (eds.), 243–272. Amsterdam: ITLI, University of Amsterdam.
Marantz, A. 1984. *On the Nature of Grammatical Relations*. Cambridge MA: The MIT Press.
Moens, M. & Steedman, M. 1988. Temporal ontology and temporal reference. *Computational Linguistics* 14: 15–28.
Mourelatos, A.P.D. 1978. Events, processes and states. *Linguistics and Philosophy* 2: 415–434. (Reprinted in *Syntax and Semantics* 14. *Tense and Aspect*, P.L. Tedeschi & A. Zaenen (eds.), 191–212. New York NY: Academic Press. 1981).

Partee, B. H. 1987. Noun phrase interpretation and type-shifting principles. In *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, J. Groenendijk, D. de Jongh & M. Stokhof (eds.), 115–143. Dordrecht: Foris.

Partee, B. H. 1999. Nominal and temporal semantic structure: Aspect and quantification. In *Prague Linguistic Circle Papers*, Vol. 3, E. Hajičová, T. Hoskovec, O. Leska & P. Sgall (eds.), 91–108. Amsterdam: John Benjamins.

Parsons, T. 1990. *Events in the Semantics of English: A Study in Subatomic Semantics*. Cambridge MA: The MIT Press.

Pylkkänen, L. 2002. Introducing Arguments. PhD dissertation, MIT.

Ramchand, G.C. 1997. *Aspect and Predication. The Semantics of Argument Structure*. Oxford: Clarendon Press.

Ritter, E. & Rosen, S.T. 1993. Deriving causation. *Natural Language and Linguistic Theory* 11: 519–555.

Rothstein, S. 1983. The Syntactic Forms of Predication. PhD dissertation, MIT.

Rothstein, S. 2004. *Structuring Events*. Oxford: Blackwell.

Schwarzschild, R. 2002. The grammar of measurement. In *Semantics and Linguistic Theory (SALT) **XII***, B. Jackson (ed.), 225–245. Ithaca NY: Cornell University.

Simpson, J. 1983. Aspects of Warlpiri Morphology and Syntax. PhD dissertation, MIT.

Talmy, L. 1985. Lexicalization patterns: Semantic structure in lexical forms. In *Language Typology and Syntactic Description*, Vol. III: *Grammatical Categories and the Lexicon*, T. Shopen (ed.), 130–176. Cambridge: CUP.

Tenny, C. 1987. Grammaticalizing Aspect and Affectedness. PhD dissertation, MIT.

Tenny, C. 1994. *Aspectual Roles and the Syntax-Semantics Interface*. Dordrecht: Kluwer.

Vendler, Z. 1957. Verbs and times. *Philosophical Review* 56: 143–160.

Verkuyl, H.J. 1972. *On the Compositional Nature of the Aspects*. Dordrecht: Reidel.

Verkuyl, H.J. 1999. *Aspectual Issues. Structuring Time and Quantity*. Stanford CA: CSLI.

Wierzbicka, A. 1967. On the semantics of verbal aspect in Polish. *To honor Roman Jakobson*. Vol. 3, 2231–49. The Hague: Mouton.

Winter, Y. 2006. Scale closure and telicity. Talk delivered at the *Workshop on Scalar Meaning*, University of Chicago.

Zucchi A. & White, M. 1996. Twigs, sequences and the temporal constitution of predicates. In *Semantics and Linguistics Theory (SALT)* VI, 329–346. Ithaca NY: Cornell University.

Zucchi, A. 1999. Incomplete events, intensionality and imperfective Aspect. *Natural Language Semantics* 7: 179–215.

Aspect and bounded quantity complements in Russian

Hans Robert Mehlig
University of Kiel

This paper investigates the actional recategorization of agentive accomplishment- and achievement-predications when interpreted in a temporally distributive manner. Temporal distributivity is present in a verbal predication if it refers to several entities involved in the given situation not simultaneously but sequentially. In this case we have an incremental relation and the complement, interpreted distributively, is a derived and thus a *secondary increment*. Therefore, the terminative or aterminative actionality of temporally distributive predications is dependent on whether the secondary increment involves a bounded or unbounded quantity. This paper attempts to show that predications with a secondary increment bounded in its extent are *hybrid* with regard to their actionality, i.e., they can be both terminative and aterminative and thus in Russian permit perfectivization not only by the paired PERF. verb but also by the delimitative procedural.

The paper is structured as follows. Section 1 explains the connection between terminativity and the category of aspect in Russian on the basis of elementary predications. Section 2 shows how elementary terminative predications (accomplishments and achievements) can be recategorized in respect of actionality by temporal distributivity. Sections 3 and 4 are devoted to the conditions under which predications, recategorized in their actionality with an increment bounded in its extent, permit the use of the IMPF. aspect in the so-called processual reading. In particular, section 3 treats the focalized-processual reading of the IMPF. aspect, section 4 the durative-processual reading. Section 5 analyzes why and under which conditions predications with a secondary bounded increment can be interpreted as aterminative and thus be perfectivized with a delimitative procedural verb, delimiting the given situation temporally. The last section concludes with a summary.

I use the following abbreviations: IMPF = imperfective verb, PF = paired perfective verb, PF-DELIM = perfective delimitative procedural verb which results from perfectivizing an imperfective verb which is aterminative by means of the prefix *PO-* delimiting the situation denoted temporally.

Key words: incrementality, aspect, actionality, progressive, definiteness, Russian