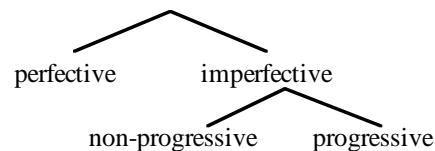


Aspect

4.1 Introduction

In chapters 2 and 3, the notion ‘aspect’ is used in the sense of ‘(inherent) lexical aspect’ (see Comrie, 1976; Van Valin, 1990), ‘aspectual class’ (see Dowty, 1979), ‘eventuality type’ (see Bach, 1981, 1986; Parsons, 1990), or ‘Aktionsart’ (see Hinrichs, 1985; Van Valin, 1990; Zaenen, 1993, for example) and the superordinate ‘telic-atelic’ distinction. In traditional grammars, ‘aspect’ is used for the perfective-imperfective distinction expressed by inflectional morphemes on the verb or by special function morphemes within a verbal complex. The imperfective aspect is further divided into progressive and non-progressive. In this latter use ‘aspect’ is also referred to as the ‘grammatical’ aspect (see de Swart, 1998). In this chapter and subsequent ones, I reserve the term ‘aspect’ for the formal distinction summarized in table 1 and their semantic correspondents. The term ‘telicity’ will be used for the telic-atelic distinction, or ‘(inherent) lexical aspect’.

Table 1: Classification of aspectual oppositions



Aspectual systems, both in terms of their formal expression and semantics, dramatically differ across languages (see Comrie, 1976; Dahl, 1985; Binnick, 1991, for example). The perfective and imperfective aspect is not uniquely tied to verbs (or verbal constructions), but it is also conveyed by case markings on the noun or by various function morphemes with an originally locative and partitive origin, for example. In terms of its formal expression, we may distinguish between two main strategies for the expression of aspect: ‘verb-centered’ and ‘noun-centered’. As examples of the first strategy I

will discuss the expression of aspect in English and Czech, and the second strategy will be illustrated with data from Finnish and German.

It has been observed that the telic-atelic distinction divides verbal predicates into cumulative (states and processes) and quantized (events) eventuality types. Such classes are to a large extent determined by the lexical semantic properties of verbs and their arguments. The semantic contribution of perfective and imperfective operators is here characterized in terms of conditions that operate on top of eventuality descriptions denoted by predicates and their arguments (see also de Swart, 1998). This strategy is pursued in extensional characterizations of the English progressive in terms of partitivity, as in Bach's (1986) mereologically based characterization, for example. On his view, a predicate like *be drinking a glass of wine* applies to events which are parts of events to which *drink a glass of wine* applies. This means that the progressive operator can be thought of as a function that maps sets of eventualities of a certain type onto their (proper) parts. Extending this mereological view of aspect, I propose that the perfective operator is a function that maps sets of eventualities of a certain type onto sets of corresponding eventualities represented in their entirety (as 'whole' entities). The semantic telic-atelic distinction and the semantic correspondents of the formal perfective-imperfective distinction, the 'part' and 'whole' functions, are orthogonal to each other and need to be clearly distinguished from each other. Nevertheless, the salient semantic properties of both these distinctions are grounded within the same mereologically based apparatus, within which the basic notions 'quantization', 'cumulativity', 'part' and 'whole' are defined.

I also propose that the semantic core of many, possibly all, aspectual systems can be characterized in terms of the basic mereological notions 'part' and 'whole'. This, however, does not mean that the semantics of various aspectual systems in all languages is reducible just to these notions and that they are equally applicable to the aspectual systems of all languages. Rather, 'part' and 'whole' are two among several contributing properties that characterize the semantics of the imperfective and perfective categories. The realization of other contributing properties will depend on the markedness relation between the members of a given aspectual opposition and the relative verb-prominence or heavy loading of information in the verb in a given language.

I will take recent accounts of the English progressive as the point of departure, and then I will turn to the formal expression and semantics of aspect in Czech. This order is chosen chiefly for expository and historic reasons. Aspectual markers in English are instantiated by clearly

identifiable forms, and when applied to a base predicate they yield a complex predicate that minimally differs from the base in aspect marking and aspect semantics. As a result we get clearly identifiable aspectual pairs, such as *John was running in the park* - *John ran in the park*. In Czech and other Slavic languages, the aspectual system cannot be described in such straightforward terms, because perfective and imperfective verb forms are here related to one another by derivational affixes and processes that tend to be formally and semantically idiosyncratic. Contrary to frequent observations or implicit assumptions, the Slavic aspectual systems are idiosyncratic in many respects and cannot be taken as the paradigm cases of the grammatical category 'aspect' with respect to which aspectual systems in other languages can be evaluated¹. Unlike the English aspect, which is clearly inflectional, the status of Slavic grammatical aspect as an inflectional or a derivational category is controversial (see Spencer, 1991) and some consider it to be a lexical-derivational category (see Dahl, 1985, for example).

Starting in the late sixties, there has been a number of studies on the semantics of the English progressive aspect that explicitly relate it to the classification of verbal predicates and sentences into eventuality types. Such studies have significantly contributed to our understanding of the progressive aspect and its interaction with predicates of different eventuality types in its scope. An adequate description of grammatical aspect must account for such systematic interactions. In this connection, I will also discuss how the perfective and imperfective verb forms in Czech map onto the eventuality types, states, processes and events.

4.2 Aspect in English: The Progressive

In the next two sections 4.2.1 and 4.2.2 I will discuss two main approaches to the description of the English progressive: the tense-logical approach and the event-based approach. The main problem that these approaches address is the following: How is the meaning of a progressive sentence related to the meaning of the corresponding simple sentence? How is the meaning of PROG[ϕ] related to the meaning of ϕ ? Matters are complicated by the fact that PROG[ϕ] does not have a uniform characterization, because its semantic properties vary according to the eventuality type of ϕ . For example, from a progressive sentence like (1a) that contains a *process* predicate we can infer the proposition asserted by the corresponding simple sentence (1b):

- (1) a. Max is swimming.
 b. Max has swum.

By contrast, this inference relation does not hold for progressive sentences based on *event* predicates and their non-progressive counterparts. For example, from (2a) we cannot infer (2b), provided (2a) has a single interpretation²:

- (2) a. Max is crossing a street.
 b. Max has crossed a street.

The intuition behind (2a) is that if Max is in the process of crossing a street then *that* crossing of a street by Max is not over. (2a) can be felicitously uttered in a situation in which Max is halfway across a street and a truck hits him, and consequently, Max will never cross the street. In other words, (2a) can be true and felicitously uttered, even though its non-progressive counterpart (2b) is false and will never be true. The progressive sentence (2a) is also compatible with a situation in which Max will eventually have crossed the street. The crucial point is that the utterance of (2a) does not commit its speaker to any particular outcome, because the actual crossing of a street is only a possible outcome of the event denoted by (2a). This roughly constitutes what Dowty (1977, 1979) labels the ‘imperfective paradox’: How can we account for the fact that for process predicates in the scope of PROG the inference from ‘x is V-ing’ to ‘x has V-ed’ is valid, while for event predicates in the scope of PROG it is not?

4.2.1 Temporally-Based Accounts

Temporally-based accounts of the English progressive can be traced back to Montague (1968), Scott (1970) and to Bennet and Partee (1972;1978). Montague’s and Scott’s definitions can be summarized as follows (see Dowty, 1979:145ff.):

Prog[ϕ] is true at an instant t if and only if ϕ is true at every instant in some open interval containing t (Montague, 1968 and Scott, 1970).

According to Montague’s and Scott’s definition, *Max is swimming* is true at time t just in case there is an open interval of time surrounding t such that *Max swims* is true at each moment in that interval. As Dowty observes, this definition of the progressive captures the intuition behind the progressive aspect as a “time-frame”, which can be found in

Jespersen (1924:178-180;1933: pp. IV-178): “the action or state denoted by the expanded tense [progressive aspect] is thought of as a temporal frame encompassing something”. For example, in *John was reading when I entered his office* the denoted reading event can be seen as forming a temporal frame within which the event of entering took place.

Montague’s (1968) and Scott’s (1970) definition of the progressive works fairly well for the progressive operator with an atelic (process) predicate in its scope, but it fails to account for the progressive operator with a telic (event) predicate in its scope. The reason is that in this case the set of moments at which Prog[ϕ] is true cannot be a function of the set of moments at which ϕ is true. To illustrate this point, consider again *Max was crossing the street*. Suppose Max starts crossing the street at 9am and is on the other side of the street at 9:13am. Then there will be a (moment of) time between 9am and 9:13am, say 9:11am, at which *Max was crossing a street* is true, but *Max crossed a street* is not. *Max crossed a street* can be felicitously uttered only at 9:13am when Max is actually on the other side of the street. Suppose Max was crossing the street and at 9:12am was halfway across when a truck hit him. In this situation, Max will never have crossed the street. Hence, it is not the case that if *Max was crossing the street* is true at t , then there is an open interval of times around t , and the corresponding simple sentence *Max crossed the street* is true at every point in that interval.

The crucial contribution of Bennett and Partee (1972/1978) to the analysis of the progressive aspect is the idea that the truth of an atomic sentence is relative to an interval, rather than to a time point (as in Montague’s 1968 and Scott’s 1970 accounts). Bennett and Partee (1972/1978) define the progressive as follows:

“[PROG ϕ] is true at I iff there exists an interval I' such that $|CI|$, I is not a final subinterval of I' , and ϕ is true at I' ” (Bennett and Partee, 1972/1978).

Bennett and Partee’s (1972/1978) definition predicts that *Max was crossing the street* is true at an interval I just in case there is an interval of time I' that properly includes I and extends beyond I at which the sentence *Max crossed the street* is true. This formulation of the semantics of the progressive is an improvement on Montague’s and Scott’s definition in so far as it does not require for its truth at I that there be any interval prior to I at which the corresponding non-progressive sentence is true. However, Bennett and Partee’s definition

also fails, because it predicts that *Max was crossing the street* is true at an interval I if and only if it will continue beyond this interval and be eventually completed so that at some larger interval I' *Max crossed the street* is true. However, a progressive sentence, such as *Max was crossing the street*, can be true at an interval I without there existing an interval I' , including and extending beyond I , at which the corresponding simple sentence *Max crossed the street* is true.

Building on the interval semantic approach of Bennett and Partee (1972/1978), Dowty (1977, 1979) argues for a further fundamental revision of the analysis of the progressive. In order to solve the ‘imperfective paradox’, Dowty (1977, 1979) rejects all the extensional analyses of the progressive operator³, and argues for its semantic treatment within an intensional framework. He proposes that the progressive is a “mixed modal-temporal” operator. The most important innovation is Dowty’s introduction of possible worlds other than the actual one. A progressive sentence is true at a given interval I just in case the corresponding non-progressive sentence is true in all the non-exceptional continuations of I , that is, in all the possible inertia worlds (abbreviated *Inr*) for the actual world. Dowty formulates this idea as follows:

“[PROG ϕ] is true at $\langle I, w \rangle$ iff for some interval I' such that $I \subset I'$ and I is not a final subinterval for I' , and for all w' such that $w' \in \text{Inr}(\langle I, w \rangle)$, ϕ is true at $\langle I', w' \rangle$ ” (Dowty, 1979:149).

Inr is a function that yields a set of “inertia worlds” for each possible world w at a particular interval I . Inertia worlds are semantic primitives that stand in a particular relation to the actual world at a given interval. Following Lewis’s suggestion, Dowty characterizes the notion of ‘inertia worlds’ as possible worlds which are exactly like the actual world “up to the time in question [that is, up to and including I , HF] and in which the future course of events after this time develops in ways most compatible with the past course of events” (Dowty, 1979:148). This means that the progressive sentence is true if the corresponding simple sentence would be true in any situation in which everything took its “normal” course. If *Max is crossing a street* is true at some interval in the actual world, then Dowty’s analysis requires that the crossing situation continues in the *inertia worlds* for the actual world, that is, in some other worlds closely related to the actual world. Given that inertia worlds need not be identical to the actual world after the point of evaluation, Dowty’s analysis predicts that an event predicate in the scope of the progressive does not entail the corresponding event

predicate. For example, for *Max is crossing a street* the completion of the event is required to take place in every inertia world at the (inclusive) interval I' , that is later than the interval at which the progressive is evaluated. Since the completion cannot hold at subintervals, it does not follow that Max crosses the street in the actual world.

In support of the claim that the progressive is an intensional “mixed modal-temporal” operator Dowty also uses “verbs of creation” in the scope of the progressive operator, such as (3):

(3) Max was drawing a horse.

If a speaker asserts that Max was, is or will be drawing a horse, then he does not commit himself to the coming into existence of a drawing of a horse, nor to any other particular outcome of the denoted event. Since the progressive sentence involves possible completed events, but not necessarily actual completed events, it also involves possible, but not necessarily actual complete, objects of creation. Therefore, the logical representation of such progressive sentences as (3) can have no existential quantification over the variable introduced by the noun phrase that denotes the object of creation (here *a horse*).

There are several problems related to Dowty’s analysis of the progressive. I will here mention only two. First, it wrongly predicts that progressive sentences have the subinterval property. If a given sentence ϕ is true at an interval I , it does not follow that the progressive of ϕ is true for every (noninstantaneous) subinterval of I (with the possible exception of the final subinterval of I). As Vlach (1981:280) observes, you can point at an empty seat next to you and felicitously ask *Is someone sitting here?*, and I can answer with *This seat is occupied, my friend is sitting here*, although no one is sitting there at the moment of speaking (as during an intermission in a theatre).

The second, and more interesting, problem has to do with the characterization of appropriate continuations, *inertia worlds*, in terms of the notion of a ‘normal’, ‘natural’ course of events. The notion ‘natural’ course of events cannot be defined in terms of more basic notions or in terms of notions that are independently needed in a model theory, such as ‘probability’ and ‘similarity’ (see Landman, 1992). In short, Dowty introduces a new semantic notion for which there is no independent motivation. In its unconstrained form, Dowty’s inertia world account leads to the wrong prediction in those cases in which the actual world involves facts that preclude the completion of the situation described by the predicate in the scope of the progressive operator, given

that inertia worlds involve the natural, expected outcome of the facts that characterize the actual world. This point can be best illustrated by Vlach's (1981:257) example: *Max was crossing the street, when he was hit by a bus*. Take the interval associated with a situation in which a bus traveling at 30 miles per hour is an inch away from hitting Max who is crossing the street. If nothing unexpected happens, if everything takes its natural, normal course, the bus hits Max. Every inertia world defined at *I* must involve both Max's crossing of the street, the bus and the fact that Max is hit by the bus at *I*. If everything follows its normal, expected course of events, it is by no means to be expected that Max will cross the street in every inertia world. Given that there are inertia worlds in which it is false that Max crosses the street, Dowty's analysis wrongly predicts that the progressive *Max was crossing the street* in *Max was crossing the street, when the bus hit him* is false. That is, if Max's crossing of the street is permanently interrupted in the actual world, then *Max was crossing the street* is false.

This problem leads Vlach to the following suggestion: "For the progressive of ϕ to be true it is not necessary that ϕ 's becoming the case later be natural, predictable, expected, probably, likely, or even (perhaps) physically possible. The bus's hitting Max is not an interruption of the natural course of events; it is the natural course of events, but it is an interruption of something" (Vlach, 1981:286). The problem with inertia worlds is that they are defined with respect to an actual world whose content is fully specified and inertia worlds take over from the actual world all the information up to the point of evaluation. Therefore, it is not possible to eliminate the facts that preclude the completion of the event that starts in the actual world. Vlach (1981:284) points to the following possible way out of this problem: "It is not the entire natural course of events that must continue uninterrupted, but some sort of restrictions to the state and actions of the subject of the sentence". For the example *Max was crossing the street*, Vlach's restriction to the appropriate 'natural course of events' may be then interpreted along the lines Parsons suggests: "x is crossing the street iff x is doing something that is such that, were it to culminate, x would thereby cross the street. (The "something" that x is doing is, of course, the crossing.) The inertia worlds analysis gets its plausibility from being understood in this manner. I see no way to retain the plausibility while eliminating the implicit reference to the crossing" (Parsons, 1990:305, fn.3).

Attempts to modify Dowty's analysis of the progressive point to the necessity to refer directly to eventualities⁴, and the general world knowledge associated with them, rather than just intervals of time. One

implementation of this idea within Situation Semantics (Barwise and Perry, 1981, 1983) can be found in Hinrichs (1983). He uses partially defined situations and courses of events, which unlike possible worlds need not contain a full specification of the actual world up to the point of evaluation. Rather, a partial course of events contains “all and only events which involve the referent of the subject NP, but exclude all other events” (Hinrichs, 1983:175).

Hinrichs’s suggestions with respect to the proper restriction on the relevant actual worlds faces the following problem. In cases, such as *Max was crossing the street*, we know which actions of the referent of the subject noun phrase would make the whole sentence true. However, for many verbs in the causative-inchoative class it is not always that obvious. This problem was noticed independently by Dowty (1979:92ff.) and also commented on by Parsons (1990:173). Take, for example, event-denoting sentences (traditional ‘accomplishments’) like *John painted a picture*. In Dowty’s (1979) decompositional analysis this sentence falls into a process (activity) part and a result part; whereby the first part is the cause of the second: [[John paints] CAUSE [BECOME [a picture exists]]]. However, there may be a variety of causal processes none of which has any predictable and necessary relationship to the second result predication, as Green (1970, 1972), McCawley (1971), Dowty (1979:92ff.) observe, for example. Take a sentence like *John is opening a door*, which can be analyzed as follows: John is now engaged in some activity of some kind that is now causing the door to become open, independently of whether the door eventually becomes open. He may open the door by pushing, kicking, striking it, by throwing something at it, by setting off an electronic device or maybe even by saying a magic word. Similarly, as Parsons (1990) observes, *John is making me a millionaire* can be brought about in a number of situations, John might be playing a lottery, gambling in Las Vegas, investing my money or John might be writing a will which would make me the sole heir to his estate. From this, it may be concluded that whether a given situation counts as being causally linked to another (its outcome) is not determined by word meaning alone, but rather by the properties of a word *together* with facts about the world and the context in which the word is used. In short, this strongly suggests that we need to take into account our knowledge about causation in general and the type of information that Fillmore, for example, captures in his notion of ‘frame’.

Despite the problems mentioned here, Dowty’s temporal-modal analysis of the progressive has been one of the most influential analyses of the English progressive. Its historical significance lies in clearly

showing the variety of issues that arise in the description of the progressive operator. Subsequent analyses of the progressive--modal, temporal-modal, non-modal (extensional)--are reactions to Dowty's analysis in trying to overcome the problems related in particular to his notion of 'inertia worlds'. Any adequate account of the progressive must be able to provide answers to questions and problems that Dowty's account poses. How some of these problems are addressed in event-based descriptions of the English progressive will be discussed in the next section in connection with the work of Vlach (1981), Parsons (1990) and Bach (1981, 1986).

4.2.2 Event-Based Accounts

4.2.2.1 Vlach (1981)

Vlach proposes the following event-based characterization of the progressive operator:

"Prog[ϕ] if and only if Stat[Proc[ϕ] goes on]" (Vlach, 1981:287).

For achievements and accomplishments, *Proc[ϕ]* is a process that leads to the truth of ϕ . "We can say that a process *P* leads to the truth of ϕ if and only if the continuation of *P* would eventually cause ϕ to become true" (Vlach, 1981:288). The operators "Stat" and "Proc" reflect the double life of the progressive operator. According to Vlach, the progressive construction is stative, and, at the same time, it asserts the existence of a process that brings about the eventuality denoted by the corresponding non-progressive predicate. Vlach motivates regarding progressives as statives by the observation that stative and progressive sentences behave in the same way with respect to specifications of time viewed as points, as examples in (4) show:

- (4) a. Max was here when I arrived.
 b. Max was running when I arrived.

A stative sentence is defined in the following way:

"A sentence ϕ is stative if and only if the truth of (*Past ϕ*) when I arrived requires that ϕ was true for some period leading up to the time of my arrival" (Vlach, 1981:273).

Therefore, on Vlach's view, *Max ran* denotes a process, whereas *Max was running* denotes a state. Viewing progressive sentences as stative sentences has, according to Vlach, the advantage, that it explains the incompatibility of the progressive operator with stative predicates (5a) and that there can be no progressives of progressives (5b):

- (5) a. *I am knowing the answer.
 b. *John was being running.

If the function of the progressive operator is to make stative sentences, then "there is no reason for the progressive to apply to sentences that are already stative" (p.274) concludes. In support of the assumption that the operator "Stat" in the definition of the progressive operator only applies to process sentences, Vlach adduces historical evidence. The constructions that gave rise to the progressive in modern English was a construction like *John is on/at/a-hunting*, where the preposition *at* should be interpreted as *engaged in* or *in the process of*.

The main problem with Vlach's proposal has to do with the characterization of progressive predicates as denoting stative predicates. A similar analysis of progressive predicates can be also found in Taylor's (1977) temporally based account⁵, in Kamp and Rohrer (1983), Saurer (1984), Parsons (1990), and in Kamp and Reyle (1993), among others. Kamp and Rohrer (1983), for example, propose that imparfait sentences in French introduce state variables, just like lexical state predicates. At first blush this analysis may seem plausible, given that both progressive and stative sentences are cumulative. In discourse, neither advances narrative time without additional inferences (see Smith, 1995a). However, as Bach (1981) points out, Vlach's characterization of progressives as statives in its unconstrained formed is problematic, because it does not recognize the distinction between dynamic and static states. Predicates denoting dynamic states can occur in the scope of the progressive operator, as examples in (6) show:

- (6) a. The socks are lying under the bed.
 b. I am living in California.

Carlson (1977) blocks the progressive from occurring with static statives by syntactically restricting the progressive to the stage-level predicate category, which includes verbs like *lie* and *live*⁶. Dowty (1979:180) distinguishes between 'interval stative verbs' and 'momentary states', whereby one of the reasons is that only the former, but not the latter, can be combined with the progressive (see chapter 2,

section 2.3.2). Carlson's stage-level states and Dowty's interval states have in common that they denote what Bach calls a 'temporary state'. As has been pointed out in chapter 2, the progressive form of a sentence focuses on periods of some dynamic, contingent, temporary condition. In (6), the acceptability of episodic states in the scope of the progressive seems to depend on the degree to which the referent of the subject-NP is moveable, "or to be more exact, (...) has recently moved, might be expected to move in the near future, or might possibly have moved in a slightly different eventuality" (Dowty, 1979:175).

By contrast, verbs like *know*, *believe*, *love* and *understand* denote static states in their unmarked, basic use, and hence do not fit the semantic requirement of the progressive construction, as can be shown with examples like the following, taken from Bach (1981:177): #*I am knowing the answer*, #*John is believing that the earth is flat*. Notice also that static state predicates are odd with temporal *when*-clauses (and specifications of time viewed as points, in general):

(7) ?Max was intelligent when I arrived.

The reason is that predicates like *be intelligent* are typically considered to denote a (more or less) permanent property of individuals. Therefore, it seems odd to assert that such a property obtains at one particular moment (barring some unusual circumstances). However, according to Bach, "in every list of such 'stative' verbs I have ever seen I have been able to find natural examples of progressives with stative verbs (with the sole exception of *be* when it combines with a prepositional phrase or nominal)". Bach illustrates this point with the following examples: *I'm understanding you but I'm not believing you, I'm really loving the play*. The static state verbs *understand*, *believe* and *love* are here coerced into an episodic interpretation. The episodic requirement imposed by the progressive operator can be also satisfied if a given static (individual-level) predicate can be construed as referring to an incremental change in the degree of the property denoted by the base predicate: *I am understanding more about quantum mechanics as each day goes by* (Comrie, 1976:36-7). Comrie observes that the reference is here to an incremental change in the degree of understanding. We may distinguish individual temporary stages of this process that are essentially different from one another. Notice that even '*be+nominal*' is acceptable in the scope of the progressive, as in Dowty's example *John is being a hero by standing still and refusing to budge* (Dowty, 1979:185). With the so-called '*be of action*' (see Parsons, 1990:35, for

example) *being a hero* can be interpreted agentively as *acting in an heroic way*.

As Bach (1981:79) suggests, progressives of progressives are unacceptable, because they are “sortally incongruous”. That is, “[ma]nifestations cannot stand in the realization relation to manifestations” (p.79), to put it in Carlson’s (1977) terms. For example, a sentence like ?*Max is being swimming in the lake* would assert that there is a Max-manifestation that has the property of being an individual such that some manifestation of that individual swims.

Similarly as Bach (1981) and Carlson (1977), Comrie (1976) concludes that the type of state implicated in progressives “... is one that is temporary, or contingent, rather than temporally unrestricted, or absolute” (p103). (...) “the basic meaning of the English Progressive is to indicate a contingent situation (...). This may well be the direction in which the English Progressive is developing diachronically, but does not give a complete characterization of its function in the modern language” (p.38). Comrie (1976:38) takes the existence of the progressive with state predicates as indicating that in English the meaning of the progressive has extended well beyond the combination of continuous meaning and non-stativity.

However, it seems that improving on Vlach’s characterization by restricting the domain of application of the progressive to temporary state predicates is also problematic. The reason is that temporary state predicates and progressives are not truth-conditionally equivalent in all the contexts. They have different interpretations in the context of a temporal *when*-clause, for example. Consider the following examples:

- (8) a. Max was happy when I arrived.
 b. Max was running when I arrived.

Smith (1995a:11-2) notices that (8a) is ambiguous. It means that (i) Max was in a state of happiness prior and during my arrival, or (ii) Max became happy when I arrived, and there may possibly be a causal connection between the two clauses: Max became happy because of my arrival. In short, the first sentence can be felicitously uttered even if the state denoted by *Max was happy* was not true for some period leading up to the time of my arrival, contrary to what Vlach claims. However, *Max was running* in (8b) denotes a situation that must be true for some period prior to the time of my arrival.

4.2.2.2 Parsons (1990)

Parsons (1990) characterizes the progressive as follows:

“If ‘A’ is an event verb, then ‘be A-ing’ is to be treated semantically as a state verb; otherwise, ‘be A-ing’ is to be treated the same as ‘A’”(Parsons, 1990:170).

Parsons characterization implies that the meaning of *John was running*, which is based on a process predicate, is truth-conditionally equivalent to the corresponding simple sentence *John ran*. Second, for every event predicate there exists a corresponding state predicate. For example, the event predicate *drew a circle* is related to a state predicate *was drawing a circle*. Given that the progressive is a state, and hence different from the event, the progressive *was drawing a circle* does not entail the corresponding event *drew a circle*. Third, progressive sentences with event predicates like *crossed a street*, *drew a circle* are “true of all crossings and drawings independently of whether they culminate” (Parsons, 1990:170). If Agatha is engaged in drawing a circle and finishes the drawing, then she is the subject of a drawing that ‘culminates’. If she is interrupted and the drawing never gets completed, then she is for a while the subject of a drawing that does not ‘culminate’. The meaning of the progressive, as defined by Parsons, entails that the denoted event is true even though the corresponding non-progressive version with ‘culminates’ is never true.

These ideas are implemented in Parsons as follows. Parsons assumes two basic aspectual relations between events and intervals: *Hold* and *Culminate*. An event either holds at an interval or it culminates at an interval, that is, it is completed. The progressive sentence (9a) is translated as (9b) (emphasis mine, HF):

- (9) a. Agatha was drawing a circle.
 b. $\exists x[\text{Circle}(x) \ \& \ \exists e\exists t[t < \text{now} \ \& \ \text{Drawing}(e) \ \& \ \text{Subject}(e, \text{Agatha}) \ \& \ \text{Object}(e, x) \ \& \ \text{Holds}(e, t)]]$

A progressive sentence requires for its truth that the situation denoted by the verb ‘holds’ for a while. The corresponding non-progressive sentence (10a) requires for its truth that the denoted event culminates, gets completed at some interval:

- (10) a. Agatha drew a circle.
 b. $\exists x[\text{Circle}(x) \ \& \ \exists e \exists t[t < \text{now} \ \& \ \text{Drawing}(e) \ \& \ \text{Subject}(e, \text{Agatha}) \ \& \ \text{Object}(e, x) \ \& \ \text{Culminates}(e, t)]]$

On Parsons' account, it is irrelevant what would be the case if the ongoing event were to continue uninterrupted, rather "the present activities are the whole story" (Parsons, 1990:170). The progressive only asserts something about the existence of incomplete events, and hence about the existence of incomplete objects (like circles that are only partly drawn). From this it follows that the progressive does not create an intensional context. Parsons defines the truth conditions for the progressive only in terms of the actual world, unlike Dowty who defines them in terms of inertia worlds.

As Parsons points out, the existence of unfinished objects gives rise to a number of problems. How much of a cake and in which form needs to exist so that one can truthfully and felicitously assert *I am making a cake*? There will certainly be an interval, when the process of making a cake has clearly begun (once the first ingredient is measured out), although there is no cake yet. Nevertheless, it is true then that you are making a cake. The case of unfinished objects like cakes (or their parts) before they are baked and houses that exist only in the form of a foundation or parts of some walls is "a general problem about the ontological presuppositions of the things we are inclined to say" (Parsons, 1990:175), and as such it has to do with "the proper use of words" (Parsons, 1990:174), that is, whether an unfinished house, for example, is properly called 'a house'. This problem is not specific to progressive predicates and arises in other contexts in which we make assertions about imaginary or non-existing objects like unicorns or houses whose construction is only intended. This is the case in the contexts of intensional verbs (*imagine, plan*) and phasal verbs (*be going to*).

4.2.2.3 Part-Whole Relations and Aspect

Building on event-based approaches to the semantics of the English progressive discussed in the two previous sections, in what follows I will relate the semantics of the progressive aspect to the mereologically based notions 'part' and 'whole'. The truth conditions for progressive predicates have been stated in terms of the notion of 'partitivity' since Bennett and Partee (1972/78) and Bach (1986). Bach (1986:12ff) suggests that the semantic function of the progressive operator can be seen as analogous to the function of the partitive operator in the

nominal domain. (See chapter 2, section 2.5.3.2 for the details.) As Krifka (1992:47) proposes, both can be viewed as introducing the mereological part relation ‘ \leq ’ into the semantic representation:

- (11) a. $\text{PART} = \lambda P \lambda x' \exists x [P(x) \wedge x' \leq x]$
 b. $\text{PROG} = \lambda P \lambda e' \exists e [P(e) \wedge e' \leq e]$

In the case of nominal expressions, the partitive operator ‘PART’ relates particular individuals to their proper parts: *a symphony - part of a symphony*. Similarly, the progressive operator ‘PROG’ relates eventualities denoted by simple sentences to their proper parts. For example, by saying *John was writing a symphony when he died* we make an assertion about a (contextually specified) proper part of a whole event denoted by the corresponding non-progressive sentence *John wrote a symphony*. As a slight departure from Krifka’s representations in (11) I propose that the English progressive operator can be understood in terms of the proper part relation ‘ $<$ ’, a strict partial ordering. The reason is that in asserting *John was writing a symphony (when he died)*, for example, the speaker explicitly excludes the final part of the denoted event, namely that subpart that includes a completed symphony.

Table 2: Structural analogies

	part	whole
cumulative	some gold He was running	* *
quantized	part of a symphony He was writing a symphony	a whole symphony He wrote a symphony

In the domain of concrete objects (or individuals), the denotational domain of nominal predicates, we focus on two dimensions. First, we pay attention to the individuation of objects, that is, we distinguish between well demarcated countable objects denoted by quantized predicates, on the one hand, and matter denoted by cumulative predicates, on the other hand: cp. *a symphony* versus *gold*. Second, we talk about parts of objects or objects in their entirety. We may refer to parts of countable objects and stuff with some partitive expressions, such as *This is part of a symphony* and *There is (some) gold in this*

coin (see Bach, 1986:12), and we can present objects in their entirety, as in *This is the /a whole symphony*.

Similarly, in the domain of eventualities, the denotational domain of verbal predicates, we distinguish between telic (or quantized) predicates, such as *write a symphony*, and atelic (or cumulative) ones, such as *run*, according to how their parts are related to their wholes (see chapter 2, section 2.5.1).

We can also represent eventualities as single integrated whole entities: *He wrote a symphony*. Such past tense sentences that are telic have a completive entailment. *He wrote a symphony* entails that 'he' finished writing the whole symphony. This can be shown by the fact that we cannot negate the final stage of such an event without a contradiction: **He wrote a symphony, but he did not finish writing it*. With process and state predicates the question of completion does not arise. Since they do not specify any definite final stage at which the eventualities denoted by them necessarily end, it simply does not make sense to say either **I drove my car, but I did not finish driving it* or **I drove my car and I finished driving it*. Hence, there is one systematic gap: '*whole+cumulative'. This follows from general knowledge inference mechanisms. Asserting that a given entity is viewed in its entirety presupposes that the entity has limits to it, that is, the verbal predicate denoting it must be interpreted as quantized or event-denoting. Notice also that *all water* in *All water is gone* refers to some contextually specific totality of water, rather than to all the water that there is, was or will ever be in the world (see Link, 1987:170).

We also make assertions about parts of eventualities, by means of a progressive construction, as in English *He was writing a symphony* and *He was running*. We make assertions about proper parts of quantized events, as in *He was writing a symphony* despite the fact that the denoted event may have never existed or will never exist in its entirety (see 'imperfective paradox' in Dowty (1977, 1979), and 'partitive puzzle' in Bach (1986)). In general, the existence of a part of an entity does not presuppose the existence of a whole quantized entity, rather it merely allows for the possible existence of a (contextually) relevant additional quantity or continuation. How such 'additional quantities' of 'continuations' in the case of partitive verbal and nominal predicates are to be specified (and, by the same token, the solution to the 'imperfective paradox' and 'partitive puzzle') is a matter of controversy. The specification of the appropriate continuations may involve possible worlds within some intensional semantic framework (see Dowty, 1977, 1979; Landman, 1992, for example). What counts as a proper continuation of an event denoted by a sentence like *He was writing a*

symphony may also be characterized in terms of a ‘prototype’ or ‘paradigm’ case, some prototypical scenario associated with the base predicate *write a symphony*. We already implicitly evoke such prototypical scenarios when we categorization predicates and sentences into eventuality types (states, processes and events) and making judgements about how parts of eventualities denoted by them stand to their wholes. Another possibility is to take Parsons’ (1990) position: namely, it is irrelevant what would be the case if the on-going event were to continue uninterrupted, rather “the present activities are the whole story” (Parsons, 1990:170). (See more on Parsons in section 4.2.2.2 above.)

The above observations presuppose that we need to draw a clear line between the quantized-cumulative distinction and the part-whole distinction in the domain of individuals and eventualities. In the domain of eventualities this translates into drawing a clear line between telicity (‘lexical aspect’) and aspect (‘grammatical aspect’). In English, overt markers of telicity are verb particles like *up* and *through* and resultative phrases (adjectival or prepositional) in the resultative construction, for example: e.g., *He ate up all the cookies*, *He thought the problem through*, *He painted the walls blue*. The verbal particle system in English and the progressive vs. non-progressive distinction are independent of each other and they co-occur:

- (12) a. He was thinking the problem through.
 b. He was thinking about the problem.
 c. He thought the problem through.

(12a) is distinct in meaning from both (12b), which is atelic, and (12c), which is telic and has a completive entailment. Examples in (12) show that telicity and grammatical aspect (progressive) are formally and semantically independent of each other: hence, each should be considered a category in its own right.

Although telicity and the semantics of ‘grammatical’ aspect belong to two dimensions in the domain of verbal semantics that are orthogonal to each other, there is not always a clear line drawn between them, which may lead to problems in delimiting their contribution to a sentence’s interpretation and in stating the regularities that govern their interactions. This line is blurred in those accounts of the semantic contribution of perfective and imperfective (and progressive) operators that characterize it in terms of eventuality types. That is, the semantic contribution of aspectual operators is characterized in terms of a function that maps sets of eventualities of a certain type onto

eventualities of some possibly other type. An example is Parsons (1990:170) definition of the English progressive (already cited in section 4.2.2.2): English progressives based on event predicates are treated semantically as state predicates and progressives based on process and (dynamic) state predicates are treated as being equivalent to process and (dynamic) state predicates, respectively. Vlach (1981) treats the whole class of progressive predicates as stative predicates. Mourelatos (1977/1981:197) and Bennett (1981:15) argue that progressives are semantically activities⁷.

Although progressive predicates seem to pattern with respect to certain properties like state and process/activity predicates, the similarities are not as clear-cut as they should be in order to justify the characterization of progressive predicates in terms of state and/or process/activity predicates. There does not seem to be any single semantic or syntactic property that progressives share with the whole class of states or the whole class of process/activity predicates. For example, progressive predicates have been claimed to share with state and process/activity predicates the subinterval property (see Dowty, 1979, for example). However, strictly speaking, the subinterval property only applies to static states. Progressive predicates have also been claimed to share with state and process predicates that they are cumulative. However, they are cumulative for different reasons. Lexical state and process predicates have no inherent boundaries in their semantic description. A progressive predicate presents an eventuality denoted by a given base predicate without regard to any boundaries, which the base predicate may inherently have if it is quantized. Also in connection with Vlach's account of the English progressive, I pointed out differences between progressive predicates, on the one hand, and state and process predicates, on the other, with respect to their interpretations in the context of specifications of time viewed as points and durative *for*-PPs. (More details on the behavior of various eventuality types with *for*-PPs can be also found in section 3.7.2.)

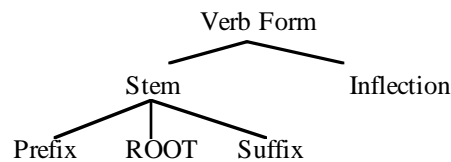
4.3 Aspect in Czech

4.3.1 Basic Morphological Facts

The majority of Slavic verb forms (finite verb forms and many non-finite verb forms, imperative, infinitive and certain participial forms, as well) are classified as perfective or imperfective. The morphological processes and affixes involved in the formation of perfective and imperfective verb forms in Slavic languages are for the most part of

derivational nature⁸. Verbs are inflected for tense, mood, number, person and gender. The markers of grammatical categories are often fused, common paradigms have frequent portmanteau morphemes. Affixes and inflections are associated with phonological processes (vowel alternation, consonant mutation, truncation). The stem is derived from a lexical root by prefixation and/or suffixation. Each Slavic language has an inventory of about twenty prefixes and several suffixes that are applied to verb roots and add further specifications to the identity of the eventuality denoted by a verb root. The hierarchical structure of the Slavic verb form can be represented as follows:

(13) Structure of the verb form in Slavic languages



There are two main schemas for deriving verb forms:

- (14) Prefixation: $V^n \rightarrow \text{prefix}+V^n$
 Suffixation: $V^n \rightarrow Y^n \text{ suffix}$
 [where “n” stands for a root or stem, “Y” stands for a verb, a noun, an adjective, an adverb, an interjection]

Derivational affixes create a new verb by changing the category and/or the meaning of the base to which they are applied. Verbal affixes incorporate meanings that are often expressed with adverbials in English: temporal (succession) and spatial (locative, directional) components are particularly prominent. This is not surprising given that many prefixes developed from prepositions and adverbials with a temporal and locational/directional meaning. Closely related to these are quantificational meanings (such as distributivity, iterativity, semelfactivity, measure) which will be discussed in chapter 5. Other modifications of the verbal root (or stem) by affixes concern manner, intensity, intention, and various affective connotations.

Let me now turn to the derivational morphological processes that determine the aspectual make up of verb forms. In what follows I will give examples from Czech. However, the points made in this section

are valid for other Slavic languages, as well. Perfective and imperfective verbs are related in the following main ways:

- (i) A perfective verb is a prefixed derivative of a simple imperfective verb:

psát ^l	→	ZA-psat ^P
write.INF		PREF.write.INF
'to write' / 'to be writing'		'to write down', 'to record'

- (ii) A perfective verb is a prefixed derivative of a simple or prefixed perfective verb:

dát ^P	→	PŘI-dat ^P
give.INF		ADD-give.INF
'to give'		'to add', 'to attach'
VY-děla-t ^P	→	NA - VY - děla-t ^P (si hodně peněz)
COMPL-do-INF		ACM-COMPL -do-INF
'to earn'		'to earn (a lot of money)'

- (iii) An imperfective verb is formed with the suffix -va- from a perfective verb⁹:

ZA-psat ^P	→	ZA-piso-VA-t ^l
PREF.write.INF		PREF-write-IPF-INF
'to write down', 'to record'		'to write down', 'to record'; 'to be writing down', 'to be recording'
dát ^P	→	dá-VA-t ^l
give.INF		give-IPF-INF
'to give'		'to give' / 'to be giving'

- (iv) An imperfective verb is formed from a perfective one by changing the extension added to the stem¹⁰:

přemluvit ^P	→	přemlouvat ^l
'persuade'		'try to persuade' / 'to be persuading'

(v) A perfective verb is formed from an imperfective verb by changing of the stem extension:

skákat ^I	→	skočit ^P
'to (be) jump(ing)' (repeatedly)		'to jump' (once)
chytat ^I	→	chytit ^P
'to chase' / 'to be chasing		'to catch'

(vi) A perfective verb is derived from a simple imperfective verb by suffixing:

kývat ^I	→	kýv-NOU-t ^P
nod.INF		nod-SUFF-INF
'to (be) nod(ding)' (repeatedly)		'to nod' (once)

(vii) A few verbs are related by a suppletive formation:

brát ^I	↔	vzít ^P
'to take' / 'to be taking'		'to take'
klást ^I	↔	položit ^P
'to put' / 'to be putting'		'to put'

As the above examples show, neither the perfective nor imperfective operator corresponds to a separate verbal affix that could be applied to all perfective or imperfective verbs. Only certain affixes are consistently associated with imperfective or perfective verbs. Most prominently, the imperfectivizing suffix *-va-* occurs only in secondary imperfective verbs and the semelfactive suffix *-nou-* occurs only in perfective verbs. In those cases in which the aspect of a given verb is not obvious from its form, we may apply a variety of syntactic and semantic tests to determine whether it is perfective or imperfective.

4.3.2 Grammatical Tests for Perfectivity and Imperfectivity

Durative and time span adverbials. Perfective verbs freely co-occur with time-span adverbials, *za hodinu* 'in an hour', while imperfective

verbs with durative adverbials, such as *hodinu* ‘for an hour’, *dlouho* ‘for a long time’, *krátce* ‘for a short time’, *do rána* ‘until morning’:

- (15) a. imperfective verb + durative adverbial
 b. perfective verb + time-span adverbial
- (16) a. Maloval^I obraz hodinu / (?) za hodinu.
 paint.PAST picture hour.SG.ACC / (?) in hour.SG.ACC
 (i) ‘He painted a/the picture for an hour.’
 (ii) ‘He was /had been painting a/the picture for an hour.’
 (when ...)
- b. Namaloval^P obraz *hodinu / za hodinu.
 PREF.paint.PAST picture *hour.SG.ACC / in hour.SG.ACC
 ‘He painted a picture (and finished painting it) in an hour.’

In (16a) ‘?’ indicates that the combination of an imperfective verb with a time-span adverbial is acceptable if the intended interpretation is inchoative (meaning that the denoted situation started after the indicated time interval), iterative or generic.

However, there are certain exceptions to the rule (15b) ‘perfective verb + time-span adverbial’. A case in point are certain perfective verbs that are derived with prefixes that have a temporal measure function. For example, in sharp contrast to most perfective verbs, accumulative (ACM) *na*-verbs and attenuative (ATN) *po*-verbs are not unconditionally acceptable with time-span adverbials: *Po*-verbs have the same range of readings as imperfective verbs, while *na*-verbs are acceptable in certain limited circumstances, i.e., with a special emphasis, at the outset of a sentence, and the like. In addition, *po*-verbs behave like imperfective verbs in that they freely co-occur with durative adverbials. This is shown in (17):

- (17) a. Po-stál^P hodinu / (?)za hodinu na ulici.
 ATN-stand.PAST hour.SG.ACC / (?) in hour.SG.ACC on street
 ‘He stood for an hour on the street.’
- b. Na-stál^P se *hodinu / (??)za hodinu na ulici.
 ACM-stand.PAST REFL *hour.SG.ACC / (??) in hour.SG.ACC on street
 ‘He spent a whole hour standing on the street.’

With regard to other standard tests, accumulative *na*-verbs and attenuative *po*-verbs behave like most perfective verbs. The clear

indication for their perfectivity is the fact that their non-past forms have a future time reference.

Tense. Tense is a deictic category, it is a “grammaticalized location in time” (see Comrie, 1985), aspect is a non-deictic category. Often categories that are considered to be aspectual are constrained with respect to tense and temporal reference. The interaction of perfective and imperfective aspect with tense in Czech is shown in the following table:

Table 3: Tense and aspect

	imperfective	perfective
past tense	(on) psal 'he wrote'/'he was writing'	(on) napsal 'he wrote'
non-past tense	(on) píše 'he writes'/'he is writing'	(on) napíše 'he will write'
future tense	(on) bude psát 'he will write'/'he will be writing'	–

In Czech, as in other Slavic languages, perfective and imperfective verbs have past and non-past forms. The perfective non-past verbs cannot usually refer to the moment of speech. A sentence with a perfective present tense verb form is understood as referring to future time in its most natural reading¹¹. Imperfective verbs have a special future tense. The future tense for imperfective verbs is periphrastic. In Czech, it is formed with the future form of the verb *být* ‘to be’: cp. for example, *bude psát* ‘he/she/it will write’. The future auxiliary cannot be used with the perfective aspect: cp. **bude napsat*^P.

Combined with such indexical adverbials as ‘right now’, ‘at this moment’, perfective non-past tense forms have an immediate future reference (except in the so-called ‘reportive present’ and with performatives, which can be said to have a present tense reference). Related to the difference in tense is the fact that only imperfective verbs, but not perfective ones, can have an on-going or ‘progressive’ reading in an appropriate context. Due to the interaction of perfective aspect with future tense, the tense in which the aspectual distinctions are most frequently and distinctly manifested is the past tense¹².

Apart from the compatibility with temporal adverbials and tense, there are other syntactic and semantic criteria that allow us to

distinguish between perfective and imperfective verbs. For example, imperfective verbs, but not perfective verbs, occur as non-finite complements of phasal verbs like *začít^P* ‘start’, ‘begin’; *přestat^P* ‘stop’, *skončit^P* ‘finish’. A summary of the tests mentioned so far is given in table 4:

Table 4: Tests for distinguishing perfective verb forms from imperfective

	<u>perfective</u>	<u>imperfective</u>
future time reference in the present tense	+	±
compatibility with the future auxiliary	-	+
compatibility with time point adverbials	-	+
compatibility with phasal verbs	-	+

4.3.3 The Semantics of Aspect

4.3.3.1 Perfective Aspect

Every episodic eventuality, that is, an eventuality which involves changes or is potentially changeable, can in principle have a beginning, a certain extent, and an end. Hence, it is cognitively significant to mark grammatically the transitions that result in a certain state, process or event or in their ending and measure their duration. They can be acquired, entered into and end, and they can be measured in terms of time periods they are associated with. In Slavic languages, prefixes are often used for this purpose.

Prefixation is one of the most common ways to derive perfective verbs from imperfective and also perfective verbs. The rich lexical semantics of verbal prefixes that serve to form perfective verbs was and is still considered to be one of the main obstacles to characterizing the semantics of all perfective verbs in a uniform way. Many Slavists agree that the “stalking [of] the wild invariant” [i.e., uniform semantic characterization for perfective verbs, HF], as Timberlake (1982:305ff.) puts it, is “extremely frustrating” (ibid.) and/or that all the candidate notions proposed (see Comrie, 1976:16ff.) are inadequate, because there can always be found classes of verbs that constitute exceptions to any of them (see Kučera, 1983:174). The relation between a given imperfective verb and its prefixed perfective counterpart involves a great deal of morphological and lexical idiosyncrasy. Prefixes have lexical semantic effects on verbs and the meaning of prefixed verbs is not

always transparently compositional, but rather often partly or fully lexicalized. Let me illustrate the functioning of prefixes with a few exemplary cases, which, of course, do not exhaust the full range of prefixal usage:

- (18) transition into a process, state or an event:
- | | |
|---|---|
| <p>imperfective
smát se
laugh.INF REFL
'to laugh' / 'to be laughing'</p> <p>milovat
love.INF
'to love'</p> <p>perfective
máchnout
sway.INF
'to swipe one's arm'
[e.g., in the air],
'to be swiping ...'</p> | <p>perfective
ROZE-smát se
INCH-laugh.INF REFL
'to start laughing',
'to burst out laughing'</p> <p>ZA-milovat se do
INCH-love.INF REFL into
'to fall in love with'</p> <p>perfective
ROZ-máchnout se
INCH-sway.INF REFL
'to swipe one's arm'
[e.g., in the air]</p> |
|---|---|
- (19) transition out of a process, state or an event¹³:
- | | |
|---|---|
| <p>imperfective
nutit
force.INF
'to force' /
'to be forcing'</p> <p>perfective
OD-počítat
DIR-count.INF
'to count up'</p> | <p>perfective
DO-nutit
TERM-force.INF
'to succeed in getting somebody
to do something'</p> <p>perfective
DO-OD-počítat
TERM-DIR-count.INF
'to finish counting up'</p> |
|---|---|
- (20) measure
- | | |
|---|---|
| <p>imperfective
stát
stand.INF
'to stand' / 'to be standing'</p> | <p>perfective
PO-stát
ATN-stand.INF
'to stand (a relatively short time)'</p> |
|---|---|

	PRO-stát PERD-stand.INF 'to stand (a relatively long time)'
plavat swim.INF 'to swim' / 'to be swimming'	ZA-plavat si MEAS-swim.INF 'to have a swim'
perfective VY-žehlit COMPL-iron.INF 'to finish ironing'	perfective NA-VY-žehlit ACM- COMPL-iron.INF 'to finish ironing a lot of [laundry]'

Let us take, for example, the prefix *na-*: in the most general terms, *na-* adds to a verb the meaning of a sufficient or large quantity, or a high degree measured with respect to a certain contextually determined scale and with respect to some standard or subjective expectation value. Closely related to these quantificational meanings are strong affective connotations. *Na-* adds satiation ('to one's heart's content', 'to tire oneself with V-ing'), high intensity ('to perform V in a protracted, uninterrupted, persistent, intensive manner'), while *po-* is often associated with connotations like 'superficially', or 'lightly'¹⁴. Prefixes may also carry various connotations of manner and intentionality, and the like, as in (21):

(21) říci ^I say.INF 'to say' / 'to be saying'	PŘE-říci ^P se PREF-say.INF 'to utter as a slip of the tongue'
--	--

There is a long tradition in Slavic linguistics to classify prefixes according to their lexical semantic contribution to the meaning of verbs into 'Aktionsart' classes (see Agrell, 1908; Maslov, 1959; Isačenko, 1960:385-418, 1962). The prefixes used in the above examples may also have other 'Aktionsart' meanings.

The meaning changes that are induced by prefixation are often not predictable, and have so far escaped any truly systematic and revealing description. Nevertheless, what all prefixes share is the following property: Applying a prefix to a given (im)perfective verb yields a new perfective verb that is telic (event-denoting). Prefixes can be thought of semantically as functions that take state, process or event predicates as

their arguments and yield event predicates as their value: PREFIX: $\mathcal{E} \rightarrow \text{event}$, where $\mathcal{E} = \{\text{process, state, event}\}$. Prefixes lexicalize the transitions into and out of processes, states or events, and the whole perfective verb asserts that the transition was (or will be) completed, or alternately is viewed in its entirety. In (18), for example, from the imperfective verb *milovat*^I ‘to love’ that is state-denoting we derive the (inchoative) perfective verb *zamilovat*^P *se* ‘to fall in love’. The perfective verb entails that the transition into the state of being in love is completed and marks the beginning of the state of being in love. Such transitions are distinct from processes, states and events themselves. The simple imperfective verb *milovat* denotes the state that results once the inchoative event is completed. It is the transitions that are represented as being completed or in their entirety by perfective verbs. Perfective verbs like *zamilovat se* ‘to fall in love’, for example, are quantized, and fail to be cumulative. *Zamilovat se* ‘to fall in love’ is quantized, since no proper part of the transition into the state of being in love can count as that (whole) transition: if it took Bill two weeks to fall in love with Mary, he did not fall in love with her in the first two days. *Zamilovat se* ‘to fall in love’ is not cumulative, since two distinct events of falling in love amount to a sum event of falling in love twice.

It may be proposed that what all perfective verbs share is the entailment that the denoted event (which itself may be a transition into an event, state or process) has run its whole ‘natural course’, and constitutes from this point of view an ‘integrated whole’. This notion has been extensively discussed in philosophy in connection with the theories of mereologies (see Simons, 1987). There are different types of ‘integrated wholes’, but in connection with the semantics of perfective verbs it is sufficient if we assume that an integrated whole has a certain function with respect to other entities, namely, it is a ‘(maximal) separated entity’, to use Krifka’s (1997) term¹⁵:

- (22) [PERFECTIVE ϕ] denotes events represented as integrated wholes (i.e. in their totality, as single indivisible wholes).

The semantic contribution of the perfective operator can be represented as a function that maps from any kind of eventuality to a ‘total event’: PERF: $\mathcal{E} \rightarrow \text{TOTAL.EVENT}$, whereby $\mathcal{E} = \{\text{process, state, event}\}$. Such a mereologically-based view of the semantics of perfective aspect dovetails nicely with Bach’s (1981, 1986) characterization of the semantics of the English progressive in terms of a partitive function and also with the traditional characterizations of the perfective aspect in

Slavic linguistics. Traditionally, one common way of characterizing the semantics of perfective aspect is as expressing ‘an action as a single or indivisible whole’, proposed, for example, by Razmusen (1891) and Maslov (1959:309). (Both are discussed in Forsyth, 1970:7-8)¹⁶. Implicitly, the characterization of the perfective aspect given in (22) involves the topological notion of ‘limit’ or ‘boundary’. As has been already observed, if a given state of affairs is represented by a verbal predicate in its entirety, there must be some limits imposed on its (temporal or spatial) extent, and consequently, it must be quantized. The view that ‘limit’ or ‘boundary’ are crucial to the semantics of perfective aspect has been taken at least since V. V. Vinogradov (1947:497)¹⁷. The characterization of the semantics of the perfective aspect in terms of the notion of ‘integrated whole’ has the advantage that it covers various other notions proposed in traditional grammar for the semantics of perfective verbs, but which individually are neither sufficient nor necessary for characterizing the semantics of the perfective operator. Comrie (1976:16ff.) and Binnick (1991:135ff.), for example, discuss ‘short duration’, ‘limited duration’, ‘completed action’, ‘successful completion of an action’ or ‘resultative meaning’, among others.

The fact that Slavic perfective verb forms in the non-past tense do not have present time reference is often interpreted as a consequence of the semantics of perfective aspect. If we assume that perfective verb forms denote events in their entirety and given that what evolves at the moment of speech is necessarily on-going, rather than viewed as a single whole, a perfective non-past tense form cannot refer to the moment of speech. Hence, perfective non-past verb forms have future time reference.

4.3.3.2 Imperfective Aspect

Imperfective verbs have a range of contextually determined interpretations. The most frequently mentioned interpretations are the following four:

- (23) a. on-going (‘progressive’ use) or incomplete (‘partitive’ or ‘conative’ use);
 b. completed events or events viewed in their entirety (‘perfective’ use);
 c. ‘general factual’ or ‘simple denotative’ use;
 d. iterated and habitual use.

For example, a simple imperfective sentence like (24) can have any of these four readings in an appropriate context:

- (24) Psal^I mi dopis.
 write.PAST me.DAT letter
 (a) 'He was writing a/the letter to me [when ...]'.
 (b) 'He wrote a/the letter to me [and finished writing it]'.
 (c) 'He wrote a/the letter to me'.
 (d) 'He (usually, regularly, etc.) wrote a/the letter to me'.

In contrast to English, for example, there are no special markers on the verb or function morphemes in Slavic languages to indicate that the denoted eventuality is to be viewed as on-going. The 'partitive' or 'conative' use can be best illustrated in those contexts in which the imperfective and perfective verbs are juxtaposed. For example, (25) asserts that the solving of the problem was only partially completed. For example, it might have only been attempted and unsuccessful ('conative' imperfective, see Forsyth, 1970:71ff.). On its own, however, the first imperfective clause in (25) does not have this reading.

- (25) Rešil^I problém, ale nakonec ho nevyřešil^P.
 solve.PAST problem but in.the.end it NEG.solve.PAST
 'He tried to solve the problem, but he did not manage to solve it in the end.'

Imperfective verb forms can be also used in contexts and with functions typically conveyed by perfective verb forms: most prominently, to denote completed events. This can be shown by the use of the imperfective verb *platili jsme* 'we paid' in the following context:

- (26) Tento týden jsme platili^I elektřinu.
 this week AUX pay.PAST electricity
 'We paid the electricity bill this week.'

Other contexts in which imperfective verb forms are used to denote completed events are questions, such as (27):

- (27) Kdo šil^I ty šaty?
 who sew.PAST this dress
 'Who sewed this dress?'

(27) would be uttered in a situation in which it is obvious that the sewing of a dress is completed. Nevertheless, the use of the imperfective verb is here the most natural choice.

In the ‘general factual’ or ‘simple denotative’ use of the imperfective aspect, there is no specific reference to the completion of the event and “the speaker is simply interested in expressing the bare fact that such and such an event did take place, without any further implications, and in particular without any implication of progressive or habitual meaning; sentence-stress falls on the verb” (Comrie, 1976:113). This use can be illustrated by (28):

- (28) Co dělal^l včera? - Opravoval^l auto.
 what do.PAST yesterday repair.PAST car
 ‘What did he do yesterday?’ ‘He repaired / was repairing the car.’

Given the wide range of contextually-determined uses of imperfective verbs in Slavic languages, I propose that the partitivity involved in the semantics of the imperfective operator is here best understood in terms of the relation ‘part-of-or-equal’, or part relation ‘ \leq ’. (Every entity is a part of itself.) The part relation ‘ \leq ’ is a weak ordering relation. (See also section 2.5.2.) This also covers the use of imperfective verb forms in contexts and with functions typically conveyed by perfective verb forms, most prominently, to denote completed events (in contrast to English progressive predicates). The imperfective operator can be characterized as follows:

- (29) [IMPERFECTIVE ϕ] relates eventualities denoted by ϕ to their parts, where the notion of ‘part’ is understood in the sense of the weak ordering relation ‘ \leq ’.

4.3.3.3 Aspect and Markedness

Implicit behind the characterization of imperfective verb forms as lacking the semantic properties that characterize perfective verb forms is the view that the Slavic imperfective aspect is the unmarked member and the perfective aspect the marked member in the aspectual opposition. This view is well established in Slavic aspectology. The principle of contrast on which it is based, namely the privative opposition, goes back to the Praguean markedness analysis (see Jakobson, 1936/71)¹⁸. The relationship between the marked and unmarked forms in the privative opposition can be schematically represented in the following way (see Kučera, 1981:179):

- (30) MARKED = lexical meaning + α
 UNMARKED = lexical meaning (no indication of α)
 ‘ α ’: ‘distinctive feature’

The marked member of the morphological opposition is defined positively, in terms of its essential and inherent meaning (‘distinctive feature’)¹⁹ and it is more restricted in meaning than the unmarked category. The unmarked member is defined as not opposing any positive or negative meaning to that of the marked member. However, the unmarked member may, in specific contexts, take on the opposite semantic value of the perfective (see Jakobson, 1932:74; Comrie, 1976:113). This view of the aspect as a privative opposition in which the imperfective is the unmarked member is supported by the fact that imperfective verbs can be used in the contexts and with a function that normally is reserved for perfective verbs (a single total event), whereas perfective verbs cannot replace imperfective ones in implying repeated action, a continuous process, or have a ‘conative’ use, for example (see Forsyth, 1970:350). According to Comrie, it is the ‘general factual’ or ‘simple denotative’ use of the imperfective that is “perhaps the strongest single piece of evidence in Russian (and similarly in the other Slavonic languages) for considering the Perfective to be the marked form” (Comrie, 1976:113)²⁰.

Departing from the view of aspect as a privative opposition, I propose that the semantics of the imperfective aspect be characterized positively in terms of the ‘PART’ function, a weak ordering relation ‘ \leq ’. The function ‘TOT’ will be used for the interpretation of perfective verbs. Positing the ‘PART’ function for the interpretation of imperfective verbs allows me to capture the intuitions behind the Jakobsonian view that imperfective aspect is the unmarked member in the aspectual opposition. The ‘PART’ function covers uses of imperfective verbs in contexts in which they are directly juxtaposed with perfective verbs and have a ‘conative’ (see above example (25)) or progressive meaning, but also uses of imperfective verbs to denote completed events. The use of the ‘PART’ function is also motivated by the specific interaction of imperfective verb forms with quantified and numerically-specified Incremental Theme noun phrases (see chapter 5).

4.3.4 Prefixes and the Slavic Aspect

Are there any prefixes that carry no lexical meaning except for the invariant ‘perfective’ meaning? The majority of Slavic verbs can be classified as perfective or imperfective. However, it does not hold that

“all verbs form aspectual pairs” (Spencer, 1991:196), or “generally speaking there exist two parallel sets of verb forms carrying identical lexical meaning, i.e. denoting one and the same type of action” (Forsyth, 1970:1). This view goes hand in hand with another commonly held and erroneous assumption that there is a fairly large number of prefixes that “are semantically empty, serving merely to mark aspect” (see Binnick, 1991:137).

Slavicists do not agree on which perfective and imperfective forms constitute aspectual pairs, and consequently on the semantic ‘invariants’ for perfective and imperfective verbs in Slavic languages. This constitutes a serious problem given that aspect is taken to be a grammatical category, and yet it appears to resist a uniform semantic characterization typical of grammatical categories like tense or number, for example. The main reason is that, for the most part, perfective and imperfective verb forms in Slavic languages are related to one another by derivational affixes and processes that are formally and semantically idiosyncratic. Uncontroversial aspectual pairs are imperfective verbs that are formed with the suffix *-va-* from perfective verbs (simple or derived), and their perfective bases. Examples are those given in (iii) in section 4.3.1, repeated here in (31):

- (31) ZA-psat^P → ZA-piso-VA-t^I
 PREF.write.INF PREF-write-IPF-INF
 ‘to write down’, ‘to write down’, ‘to record’;
 ‘to record’ ‘to be writing down’, ‘to be recording’

From the perfective verb *za-psat^P* ‘to write down’, ‘to record’ we can derive the imperfective verb *zapiso-va-t^I* with the suffix *-va-*. While the simple imperfective verb *psát^I* ‘to write’, ‘to be writing’ and the perfective *za-psat^P* differ from each other both in aspect and lexical semantics, the only difference between *za-psat^P* and *zapiso-va-t^I* is in aspect. Other aspectual pairs can be found among perfective and imperfective verbs that differ in a theme extension added to the stem, as in *chytat^I* ‘to chase’ - *chytit^P* ‘to catch’²¹ and in Russian also with pairs of verb forms that differ in the placement of stress, as in *urézat^P* ‘to cut off’ - *urezát^I* ‘to cut off’; ‘to be cutting off’, for example.

Examples like (31) show that if an imperfective verb is built with the suffix *-va-* from a perfective verb, the meaning change is regular and predictable, it is restricted to the change in aspect: perfective → imperfective. However, if a perfective verb is a prefixal derivative of an imperfective verb, there is typically a change in lexical semantic properties, which may not be systematic and predictable. The most

discussions and disagreements in traditional Slavic and contemporary linguistics revolve around the question whether there are any aspectual forms of the type ‘simple imperfective verb - prefixed perfective verb’. This amounts to the question whether there are any prefixes whose only semantic contribution is to perfectivize imperfective verbs without changing their lexical semantic properties. Answers to the latter question cover the whole spectrum, from claims that there is a fairly large number of such prefixes (see Binnick, 1991:137, Schoorlemmer, 1995), to arguments that there are none, as in Isačenko (1960, 1962), for example. It is best to conclude with Isačenko that there is no single all-purpose neutral prefix or set of such prefixes. In what follows I will motivate why in more detail.

For Czech, Šmilauer (1968;1971:165) lists twenty prefixes that serve to derive perfective verbs:

1. do-, 2. na-, 3. nad-, 4. o-, 5. ob-, 6. od-, 7. po-, 8. pod-, 9. pro-, 10. pře-, 11. před-, 12. při-, 13. roz-, 14. s-(sou-), 15. u-, 16. v-, 17. vy-, 18. vz-, 19. z-, 20. za-.

Among these there is no single all-purpose neutral prefix whose *only* function would be to derive perfective verbs without changing lexical semantic properties of the base verb. While it holds without an exception that adding a prefix to a simple imperfective verb yields a perfective verb, apart from this regular change in aspect, prefixes have lexical semantic effects on verbs and the meaning of prefixed verbs is not always transparently compositional, but rather often partly or fully lexicalized. Prefixes typically exhibit polysemy and homonymy, and not all prefixes attach to all verbs. One prefix can be applied to different imperfective verbs, or classes of verbs, with different semantic effects. This is shown with the prefix *u-* in (32):

- (32) a. partitive
 U-jíst^P chleba
 PREF-eat.INF bread.SG.GEN
 ‘to eat a little from (the/some) bread’
- b. completive
 U-plést^P svetr
 PREF-knit.INF sweater.SG.ACC
 ‘to knit (and finish knitting) a/the sweater’

c. intentionality

U-řeknout^P se
 PREF-say.INF REFL
 ‘to misspeak’, ‘to blab out (unintentionally)’

d. root modality

U-nést^P
 PREF-carry
 ‘to be able to carry’

In structuralist approaches, different uses of a given prefix are considered to be contextually determined variants of one abstract feature. Such variants are usually listed as separate items. They are connected to each other in so far as it is assumed that all of them are somehow related to the postulated common feature. However, the nature of this relation ‘common feature - contextually determined feature(s)’ remains somewhat mysterious. In many cases it is not at all obvious what it is.

Different prefixes can be attached to one verb root or stem, so that to one and the same simple imperfective base there typically exists a cluster of prefixed perfective verbs, rather than just one prefixed perfective verb. This is illustrated by the perfective verbs that can be derived from the imperfective verb *psát* ‘to write’, ‘to be writing’:

(33) simple imperfective verb

psát ‘to write’/‘to be writing’

prefixed perfective verb

napsat ‘to write (up)’
 nadepsat ‘to write above’, ‘to entitle’
 dopsat ‘to finish writing’
 obepsat ‘to write all around’
 odepsat ‘to reply in writing’
 opsat ‘to copy’
 popsat ‘to cover with writing’, ‘to describe’
 přepsat ‘to write over/again’, ‘to copy’
 předepsat ‘to prescribe’
 připsat ‘to add by writing’
 sepsat ‘to write up’
 vepsat ‘to write in between’, ‘to insert’
 vypsat ‘to write out’, ‘excerpt’; ‘to use up by writing’
 zapsat ‘to note down, record’

With the possible exception of the prefix *na-* in *napsat^P* ‘to write (up)’, the meaning of other derived perfective verbs is clearly different from that of the simple imperfective verb *psát^I* ‘to write’, ‘to be writing’. Since the difference is both in aspect and in the lexical meaning, this type of relation between verbs is clearly derivational. The meanings in most of the above examples can be derived compositionally or are at least transparent. For example, the prefix *pře-* ‘over’, ‘across’, ‘again’ is related to the spatial preposition *přes* ‘over’, ‘across’ and it also has the temporal meaning of iterativity by a common transposition from space to time. Hence, when combined with *psát^I* it yields *pře-psat^P* ‘to write over/again’, ‘to copy’.

Russian structuralists (Tichonov, 1962; Avilova, 1976, for example) claim that prefixes that have lost their spatial meaning are candidates for being ‘empty’, that is, they carry no lexical meaning except for the invariant ‘perfective’ meaning. They also claim that despite the fact that the prefixed perfective verb with such an alleged ‘empty’ prefix is more limited in semantic scope than the simplex imperfective verb, the prefixed verb is semantically equal to its simplex base verb²². However, this means that the semantic identity of the prefixed perfective verb with the base verb is not a necessary condition for the existence of ‘empty’ prefixes and in some instantiations a prefix can be more ‘empty’ than in others. Given this, it is unclear how a prefix with a purely aspectual perfectivizing function can be identified.

In Modern Russian, the prefix *po-*, as in *postróit^P* ‘to build’, is considered “the most neutral prefix semantically” (see Comrie, 1976:89; and also V. V. Vinogradov, 1947:553ff., Townsend, 1968:117, Flier, 1977:224)²³. Other classic examples of perfective verbs with ‘empty’ prefixes in Russian are *na-*, as in *napsat^P* ‘to write up’, *s-*, as in *sdelat^P* ‘to do’. According to Smilauer (1971:166), the most frequently used prefixes in Czech are *po-*, *vy-*, *za-*, and also *u-*, *na-* and *s-*. Such prefixes are also considered to function as perfectivizers with no independent lexical semantic contribution in such perfective verbs as those given in (34):

- (34) a. *postavít^P* ‘to build’; *pozdřívít^P* ‘to say hello’,
 pochválit^P ‘to give praise’; *poradit^P* ‘to give advice’;
 b. *napsat^P* ‘to write up’; *nasnídat^P* se ‘to have breakfast’;
 c. *udělat^P* ‘to do’; *uvěřit^P* ‘to (come to) believe’.

One of the crucial arguments in support of the existence of verbs with prefixes that have no other semantic function but to perfectivize

imperfective verbs concerns the possibility of having secondary imperfective verbs formed from them. It is argued that perfective verbs with ‘empty’ prefixes do not form secondary imperfectives (see Forsyth, 1970). So we get (35a), but not (35b):

- (35) a. PŘE-psat^P → PŘE-piso-va-t^P
 OVER-write.INF OVER-write-IPF-INF
 ‘to write over/again’, ‘to write over/again’ or
 ‘to copy’ ‘to be writing over/again’, ...
- b. NA-psat^I → *NA-piso-va-t^I
 PREF-write.INF *PREF-write-IPF-INF

Forsyth (1970) points out that “[i]f any ‘new’ meaning were perceptible in such [Russian] perfectives as *sdelat’*, *napisat’* and *razbudit’*, imperfectives such as **sdělyvat’*, **napisyvat’*, **razbuždat’/razbuživat’* would have come into general use” (Forsyth, 1970:41). However, this is a rather weak argument for the existence of prefixes as perfectivizers pure and simple. Since the number of prefixed verbs that have no secondary imperfective counterparts is restricted, such a delimitation of ‘empty’ prefixes would significantly reduce their number so that their existence would be a marginal phenomenon. At the same time, there are prefixes that add a variety of meanings to the verbs to which they are applied, and yet the verbs derived with them typically have no imperfective counterparts with suffix *-va-*. An example is the Czech accumulative prefix *na-* (see (20) above).

In cases in which a given prefixed perfective verb has no secondary imperfective counterpart and appears to be equivalent to the corresponding simple imperfective verb in its lexical semantic properties, a fine-grained semantic analysis often reveals that the prefix actually reiterates some inherent semantic feature of the verb (see Comrie, 1976:89, among others). Since the meanings of the prefix and the verb root overlap, the prefix appears to carry no lexical meaning except for the invariant ‘perfective’ meaning. This can be illustrated with the prefix *na-*, as in (36):

- (36) a. psát^I něco NA papír
 write.INF something on paper
 ‘to write/to be writing something on a piece of paper’

- (36) b. NA-psat^P něco NA papír
 ON-write.INF something on paper
 ‘to write up something on a piece of paper’

The imperfective verb *psát^I* is associated with a scene in which a writer uses some instrument that leaves traces on some surface. The prefix *na-* has two main meanings: (a) locational sense: ‘on’ or ‘onto’, and (b) accumulative or measure sense (which we may leave aside here)²⁴. One way of interpreting the contribution of the prefix *na-* in the perfective verb *napsat^P* is to think of it as having its locational meaning ‘on’ and as overlapping with locational relation between the writing instrument and the flat surface that is present in the frame associated with the corresponding imperfective verb *psát^I*.

A similar situation can be found with other perfectivizing prefixes in Slavic languages that developed from prepositions and/or adverbs with locative or directional meanings that are synchronically still detectable. In this respect, prefixes in Slavic languages are similar in origin to the derivational prefixes or verbal particles in other Indo-European languages. Take, for example, the prefixes and particles in the following English examples: *rewrite*, *underwrite*, *write in*, *write down*, *write up*, *write out*, etc.

The existence of prefixes that function only as perfectivizers without contributing any lexical semantic properties to verbs to which they are applied was denied by Van Schooneveld (1958) and Isačenko (1962:358-63), for example. (See also Forsyth (1970:36-43), for a discussion on ‘empty’ prefixes.) This view led to the emphasis on the research on Aktionsart²⁵. In its original narrow morphological sense, ‘Aktionsart’ was used in structuralist linguistics, in particular in the work of Isačenko (1960;1962:385-418) and Maslov (1959), to categorize the semantic contribution of individual affixes to the meaning of derived verb. (37) contains a few representative examples of Czech prefixes and their ‘Aktionsart’ in perfective prefixed verbs. As these examples show, ‘Aktionsart’ includes notions related to measure, phase, degrees of intensity, as well as such quantificational notions as ‘distributivity’. ‘Aktionsart’ differences can be found in other languages, as well. For example, the category of ‘attenuative’ (or ‘diminutive’) Aktionsart can be found in German, as in *lieben* ‘to love’ and *liebeln* ‘to love superficially’, *lachen* ‘to laugh’ and *lächeln* ‘to smile’, as well as in English, as in *spark* and *sparkle*, *suck* and *suckle*, *wag* and *waggle*.

(37) AktionsartPREFIX+stem

inceptive	ROZplakat se ‘to burst into tears’
absorptive	ZApovídát se ‘to become absorbed in conversation’
attenuative	POhoupat ‘to swing a little’
terminative	DOhořet ‘to burn out’
totalizing	PROvrtat ‘to drill through’
perdurative	PROspat ‘to sleep for quite a while’
distributive	POzamykat ‘to lock one after another’

To conclude, prefixation induces aspect shift and in most cases also some change of lexical meaning. This observation and others mentioned in this section make it sufficiently clear why the verb aspect (perfective and imperfective) in Slavic languages raises a number of difficult theoretical questions. The most controversial ones regard the distinction between inflection and derivation (see Spencer, 1991:196-7) and the relation between grammar and lexicon. One of the main issues in Slavic linguistics, especially during the structuralist era, regarded the characterization of the categories of ‘aspect’ and ‘Aktionsart’ and precise delimitation of their domains of application. The line is most often drawn between aspect as a grammatical category and Aktionsart as a lexical-derivational category. This view can be found in Maslov (1959:160), for example, who also states that Aktionsart and aspect describe the manner in which the action proceeds. Such vague notional characterizations blur the line between Aktionsart and aspect. In the absence of clear formal criteria, the claim aspect is a grammatical category and Aktionsart a lexical-derivational category seems to amount to a mere postulation, a methodological assumption that follows from structuralist doctrines. Nevertheless, Maslov’s view still seems to be popular in Slavic linguistics and can be found in standard reference grammars. Along these lines, Andersson (1972), for example, claims that Russian aspect is an inflectional rather than a derivational category.

However, the picture is not as simple as that. There does not seem to be any ready answer to the question whether the category ‘aspect’ in Slavic languages is an inflectional or a derivational category. As we have seen, perfective and imperfective verbs are related by derivational processes that have effects on the aspectual properties of verbs they operate on. Since derivation creates new lexemes, any derivationally expressed category would have to be lexical rather than grammatical. Although suffixation with the imperfectivizing *-va-* has inflectional characteristics, it is not fully productive, because *-va-* cannot be attached to all perfective verbs. According to Dahl (1985), Slavic perfective and imperfective categories are not to be seen as inflectional categories, but

rather mainly as lexical-derivational categories that are partially grammaticalized (see Dahl, 1985): “The semantic differences that we have seen might then reflect the fact that the Slavonic categories grammaticalize *perfectivity : imperfectivity* on the lexical rather than on the level of inflectional morphology” (Dahl, 1983:19).

According to Spencer (1991:197), Slavic aspectual distinction in verbs provides an excellent example of the fuzziness of the inflection-derivation distinction. Spencer (1991) concludes that “Russian aspect provides an example of what appears at first sight to be inflectional morphology behaving like derivational morphology. (...) Faced with these and other kinds of conundrums, many linguists have chosen to abandon the distinction between inflection and derivation. A more positive reason for this choice is the fact that there never seems to be a principled morphological distinction between the two types of morphological processes, in the sense that the morphological devices of affixation, phonological processes and so on are just as likely to be used for derivation as for inflection” (Spencer, 1991:197).

Are prefixes grammatical markers of perfective aspect? In section 4.3.3.1 it was proposed that prefixes can be thought of as functions that take state, process or event predicates as their arguments and yield event predicates as their value. It was also proposed that the semantic contribution of the perfective operator was proposed to be a function that maps from any kind of eventuality to a ‘total event’: PERF: $\mathcal{E} \rightarrow \text{TOTAL.EVENT}$, whereby $\mathcal{E} = \{\text{process, state, event}\}$. This seems at first blush to be compatible with the commonly made claim that prefixes are overt grammatical markers of perfective aspect (see Spencer, 1991; Binnick, 1991:137; Krifka, 1992:50; Piñón, 1994; Zucchi, 1997). Although prefixation is one of the most common ways to derive a perfective verb from an imperfective one, from this observation alone one cannot conclude that prefixes are aspectual operators. To make this point clear, let me now compare the behavior of verbal prefixes with what are taken to be typical and uncontroversial markers of grammatical aspect, namely those found in English and French.

Aspectual markers in English and French have two characteristic properties: First, they are instantiated by clearly identifiable forms, and when applied to a base predicate they yield a complex predicate that minimally differs from the base in aspect marking and aspect semantics. As a result we get clearly identifiable aspectual pairs, such as ‘progressive-nonprogressive’ in English, e.g., *John was running in the park* - *John ran in the park*, or ‘imparfait-passé simple’ in French, e.g., *il mourait* (‘he was dying’) - *il mourut* (‘he died’). Their aspectual

contribution can be characterized in a uniform way in terms of a function that maps sets of eventualities of a certain type onto eventualities of some possibly other type. An example is the definition of the English progressive by Parsons (1990:170), discussed in section 4.2.2.2. Or, their aspectual contribution is characterized in terms of conditions that operate ‘on top of’ the eventuality types, which are in turn determined by the semantics of base predicates and their arguments. This strategy is pursued in various extensional characterizations of the English progressive in terms of partitivity, as in Bach’s (1986) mereologically-based account, for example.

Second, explicit markers of grammatical aspect that are of the same type cannot be recursively applied to one another. For example, progressives of progressives in English are excluded, as Vlach (1981) and Bach (1981) observe:

- (38) a. John was running. PAST[PROG[run(John)]]
 b. *John was being running. *PAST[PROG[PROG[run(John)]]]

Unlike markers of grammatical aspect, prefixes can be iterated in certain combinations and combinations of two or three prefixes are easy to find (39), and prefixes are applied to simple perfective verbs (40):

- (39) **OD**-počítat^P → **DO-OD**-počítat^P
 DIR-count.INF TERM-DIR-count.INF
 ‘to count up’ ‘to finish counting up’
- (40) dát^P → **PŘI**-dat^P
 give.INF ADD-give.INF
 ‘to give’ ‘to add’, ‘to attach’

Prefixes co-occur with the aspectual suffix *-va-* within the same verb:

- (41) **VY**-dělá-VA-t^I → **PŘI - VY** - dělá-VA -t^I
 PREF-do-IPF-INF ADD-COMP-do-IPF-INF
 ‘to earn’ / ‘to be earning’ ‘to earn additional income’

Notice that in general the presence of the suffix *-va-* marks the verb as imperfective, regardless of the prefixes it may or may not contain, but the presence of a prefix does not mark the verb as perfective. Hence, the mere presence of a prefix in a derived verb is not a sufficient indication

that the verb is perfective. Given that the suffix *-va-* has an aspectual function only, namely to derive imperfective verbs from perfective ones (see example (31)), it has inflectional characteristics. Given that it occurs with one or more prefixes within one and the same verb, it must then follow that prefixes cannot be inflectional markers of aspect. On independent grounds it is assumed that overt markers of the same grammatical category cannot be recursively applied to one and the same verb. Just as we do not find present and past tense morphemes on the same verb, so in the case of grammatical aspect, a given verb contains only one overt aspectual morpheme. In general, overt markers of different members of the same inflectional category do not co-occur on the same verb.

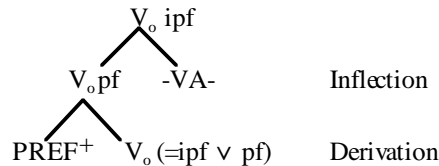
Finally, prefixes that serve to derive perfective verbs typically alter lexical semantic properties of verbs, including their eventuality type. The change in lexical semantics of derived verbs has effects on valence and/or (morphological) case government, which in turn may lead to changes in the grammatical function status of arguments. Prefixes often serve as arity-augmenting, in particular transitivizing, devices. This is true for Slavic languages and other Indo-European languages, as well as for typologically unrelated languages, such as Georgian and Hungarian, for example (see Comrie, 1976:88ff.). (I will address this point in more detail in section 4.3.6.)

The above data and observations suggest that prefixes exhibit behavior typical of derivational morphemes, which sets them apart from the expression of aspect by inflectional morphemes and grammaticalized syntactic constructions. A perfective prefixed verb in Slavic languages is a new verb that stands in a derivational relation to its base, rather than being a different form of one and the same lexeme (see also Dahl, 1985; Spencer, 1991). Neglecting this fact turns out not to be a harmless simplification, but leads to wrong predictions about the formal and semantic properties of prefixes and their status in the grammatical system. If the perfective-imperfective distinction expressed by morphemes on the verb is inflectional, as is commonly assumed, and if prefixes are viewed as aspectual operators that perfectivize imperfective verbs, then we have a derivational process which is simultaneously claimed to be inflectional, “a contradiction in terms”, as Spencer (1991:196) observes.

Characterizations of prefixes as ‘perfectivizers’ are based on the assumption that prefixes can be only applied to imperfective verbs. This motivates Kipka’s (1990:31) morphological constraint against multiple prefixation: “at most one aspectual prefix can appear on a Polish verb”. Such a constraint incorrectly excludes verb forms like

those in (39) and (41). (Although I here draw on examples from from Czech, analogous examples can be found in Polish, Russian, and other Slavic languages, as well.) Piñón (1994:493-4) tries to improve on Kipka's constraint by observing that there are verb forms with two aspectual prefixes. However, in such a case the second prefix is applied to a complex imperfective verb, which is derived with the suffix *-va-* from a prefixed perfective verb. Also Piñón's constraint is flawed, because it incorrectly predicts that we should not find perfective verbs with two prefixes and no imperfective suffix *-va-*, such as *do-od-počítat^P* 'to finish counting up' in (39), and it also excludes the possibility of prefixes being applied to simple perfective verbs, as in (41). Since prefixes can be applied to (prefixed) perfective verbs, they cannot be viewed as aspectual markers. Recall that explicit markers of grammatical aspect of the same type cannot be recursively applied to one another. Assuming that inflection applies after all word formation rules, the inflectional suffix *-va-* is attached to the verb after all the prefixes have. The hierarchical structure of Slavic prefixed verbs can be then schematically represented as in (42):

(42) Hierarchical structure of Slavic prefixed verbs



One could still try to defend the view that prefixes are perfectivizers by proposing that only prefixes that are applied to imperfective verbs are inflectional devices and introduce the perfective operator into the semantic representation of sentences, while those that are applied to verbs that are already perfective have no aspectual contribution or their aspectual contribution is the identity function. This must be rejected, because one and the same prefix can be applied to imperfective and perfective verbs with the same lexical semantic effect, and yet it would be treated as 'ambiguous' between being a derivational or an inflectional morpheme. Take, for example, the terminative prefix *do-* in (i) *do-od-počítat^P* 'to finish counting up' in (39) and (ii) *do-počítat^P* 'to finish counting'. While in (i) *do-* would not count as a perfectivizer, because it is applied to the perfective verb *od-počítat^P* 'to count up', but in (ii) it would, because it is applied to an imperfective verb *počítat^I* 'to count',

‘to be counting’. Notice also that in the former case the prefix changes both the lexical semantic and aspectual properties of the verb. This would lead to the contradictory conclusion that one and the same prefix has both an inflectional (aspectual) and lexical-derivational function.

Another possible solution would be to propose that perfective aspect in Slavic languages can be realized not just by a single prefix, but also by a combination of two or more prefixes functioning as a single unit. The problem with this solution is that it forces us to postulate unmotivated and quite implausible meanings for combinations of prefixes. What is even more troublesome is providing empirical motivation for various combinations of prefixes. Take, for example, perfective verbs that are derived with the distributive *po-* and the accumulative *na-*: *po-na-tahať sem zbytečné krámy* - ‘he gradually dragged here a lot useless junk’. (See also Isačenko (1960:249) for similar examples from Russian and Slovak.) Can we find any language(s) that conflate(s) within a simple monomorphemic verbal affix ‘distributivity + accumulation + graduality’, for example?

There is yet another reason against viewing complex combinations of prefixes on one verb as a single unit. Individual prefixes semantically function as independent units, even in highly conventionalized combination, such as the *pona-*verbs just mentioned. Some may manifest scope effects and depending on the order in which they are attached to the stem, they may have different scope effects and different effects on the reading of a whole sentence.

Given the above observations, I conclude that prefixes are lexical-derivational operators, and hence their domain of application is at the level of lexical semantics of verbal predicates. They are lexical V-operators that semantically operate as eventuality description modifiers. If we assume that operators of grammatical aspect (perfective and imperfective) are applied to eventuality descriptions, then there is nothing contradictory or inconsistent about prefixes co-occurring with the imperfectivizing suffix *-va-*, and that they can be iterated in certain combinations and applied to perfective verbs.

4.3.5 Aspect and Eventuality Types

There have been two attempts to provide a typology of eventuality types for Czech that are based on the categories proposed by Vendler (1957/1967): Kučera’s (1983) and Eckert’s (1984, 1985)²⁶. I will show that the typology of eventuality types proposed in chapter 3, based on examples from English, is applicable to Czech, as well.

As has been observed in section 3.7.3 (*A Note on Genericity, Habituality and Iterativity*), the classification into eventuality types concerns verbal predicates and sentences that denote single eventualities: ‘atemporal’ states, single episodes of dynamic states, processes or events. This means that the large and productive class of Czech habitual verbs falls outside the typology suggested here. These are verbs that are formed with the suffix *-va-* from simple and derived imperfective verbs²⁷:

(43)	imperfective simplex	→	derived <u>habitual</u> imperfective
	hrá-t		hrá- <u>VA</u> -t
	play-INF		play- <u>HAB</u> -INF
	'to play'		approximately: 'to tend to play',
	'to be playing'		'to have the habit of playing'

Table 5 contains minimal pairs of imperfective and perfective verb forms that differ in aspect and in their eventuality type. There is an asymmetry between perfective and imperfective verbs with respect to telicity. In general, perfective verbs are telic or event-denoting. (Except for such verbs as *unést^P* ‘to be able to carry’ and possibly a few other perfective verbs). Imperfective verbs fall into two groups: states and processes are atelic, while culminations and happenings are telic. A complex verbal predicate that is headed by an imperfective verb that denotes an incremental eventuality is telic (quantized) or atelic (cumulative) depending on the quantization properties of the Incremental Theme argument. (The interaction of perfective and imperfective aspect with the Incremental Theme argument will be discussed in detail in chapter 5.) Morphologically nonderived verb stems tend to be imperfective²⁸. A large class of these is constituted by static state (or individual-level) verbs, that is, verbs denoting non-temporary states of individuals. Static state verbs have no corresponding derived perfective counterparts at all (see *mít rád* ‘to like’, ‘to love’ in Table 5). The aspectual opposition is neutralized in the case of static state verbs²⁹, which can be motivated on semantic grounds. As has been proposed above, [PERFECTIVE ϕ] denotes events represented as integrated wholes (i.e. in their totality, as single indivisible wholes). Hence, perfective verbs are event-denoting. This also means that they presuppose that the property attributed to a given individual is viewed as temporary or contingent, or at least *not* in some sense ‘atemporal’. However, static state predicates denote unchangeable, permanent properties of individuals and are not easily reinterpreted as properties of temporally limited and contingent stages of individuals, which excludes

their occurrence with the perfective aspect in Slavic languages, and also with the progressive in English, for example (see Carlson; 1977, Bach, 1981:78).

Table 5: The interaction of aspect and eventuality types

EVENTUALITY TYPE	ASPECT
static state event	IPF: mít rád 'to love', 'to like' PF: --
dynamic state event	IPF: stát 'to (be) stand(ing)', PF: postát 'to stand (for a short time)'
process event	IPF: spát 'to (be) sleep(ing)' PF: prospat 'to sleep (for a long time)'
incremental eventuality	IPF: vysvětlovat 'to (be) explain(ing)' \neq TELIC
incremental event	PF: vysvětlit 'to explain'
culmination (event) culmination (event)	IPF: přicházet 'to arrive', 'to be arriving' PF: přijít 'to arrive'
happening (event) happening (event)	IPF: -- PF: spatřit 'to notice', 'to spot'

In general, it is the unmarked member, formally and/or semantically, in a given opposition that is used in neutralizing contexts, while the marked member is excluded or much less frequent. If we follow the standard assumption that the imperfective in Slavic languages and the nonprogressive in English are unmarked members of the aspectual opposition, mainly on the grounds that they are less restricted in their distribution than the marked progressive and perfective, it is unsurprising that they are used in contexts in which the aspectual opposition is neutralized. Similarly, Comrie (1976) also observes that "in the case of verbs which for semantic reasons have only one form, (...) the form that is appropriate semantically will be used. But we would not expect to find verbs with the morphology of the marked aspect being used irrespective of aspect, or only with the meaning of the unmarked aspect, at least not as a regular phenomenon" (1976:116).

The above observations also point to close semantic affinities among stativity, genericity and imperfectivity (see also Filip and Carlson, 1997): generics are stative, and the semantic character of stativity is semantically more compatible with imperfectivity than with perfectivity.

Prefixes with a measure function are often applied to imperfective verbs that denote states or processes and derive perfective event-denoting verbs. This can be illustrated with the attenuative prefix *po-* and perdurative *pro-* applied to the imperfective verb *stát*¹ ‘to (be) stand(ing)’:

- (44) a. *Po-stál*^P *chvíli* *na ulici.*
 ATN-stand.PAST while on street
 ‘He stood for a while on the street.’
- b. *Pro-stál*^P *hodinu* *na ulici.*
 PERD-stand.PAST hour on street
 ‘He stood for a while on the street.’
 ‘He spent a whole hour standing on the street.’

The attenuative *po-* incorporates the meaning of ‘a relatively short period of time’. The perdurative *pro-* contributes the meaning of ‘a relatively long period of time’ to the eventuality expressed by the verb root. In (44) the prefixes *po-* and *pro-* function as measures over events. They can be seen as standing to cumulative verb stems or roots as measure, quantity and numeral functions stand to cumulative nominal predicates (mass and plural). Some examples illustrating this parallelism are given in the following table:

(45)	measure function	cumulative N/V-argument
	a jar (of)	cookies
	a bottle (of)	water
	for a long/short time	John ran
	<i>po-</i> , <i>pro-</i> , <i>za-</i>	verb (root)

Among the predictable and productive ‘shifts’ between eventuality types that accompany the change in aspect is the ‘shift’ between a process and a happening. With the semelfactive suffix *-nou-* we can derive from an imperfective verb that denotes processes a perfective verb that denotes happenings:

(46)	vzdychat ^l 'to be sighing (once)' 'to sigh (repeatedly)' 'to keep sighing'	→	vzdych- nou-t ^p 'to sigh (once)'
aspect:	imperfective		perfective
eventuality type:	process (atelic)		happening (telic)

The suffix *-nou-* incorporates the notion of quantity: 'one' instantiation of a given happening. The corresponding simple imperfective verb form can be used in contexts that enforce a single process or an iterative interpretation.

In the pair of verb forms denoting incremental eventualities, the imperfective may be a suffixal derivative of the perfective verb, as in (47):

- (47) a. Vysvětlil^p mi svoji posici.
explain.PAST me.DAT his position
'He explained his position to me.'
- b. Vysvětloval^l mi svoji posici.
explain.IPF.PAST me.DAT his position
'He explained/was explaining his position to me.'

The verb phrase denotes an incremental eventuality and the Incremental Theme argument is here 'his position'. It can be thought of as consisting of a number of ordered steps (arguments, sets of beliefs, etc.) constituting its parts. Under this interpretation 'his position' is quantized, and therefore, the verbal predicate is quantized, as well. The perfective sentence entails that all the steps or parts of the position have been gone through and hence the event is completed. The imperfective sentence does not have this completive entailment.

Perfective verbs denoting incremental events and culminations differ from those denoting happenings in that they have imperfective counterparts. Verbs denoting happenings, such as *spatřit^p* 'to notice' are conceived of as events whose beginning and end fall together into a single moment. They are lexicalized as having neither duration nor internal structure. This explains why they have no imperfective counterparts. For example, there is no *spatřovat^l* that can be derived from *spatřit^p* 'to notice'³⁰.

Perfective verbs denoting incremental events differ from perfective verbs denoting culminations and happenings in that they cannot always be combined with point adverbials. This is shown in (48):

- (48) a. Napsal^P dopis ??ve tři hodiny. incremental event
 write.PAST letter ??at three o'clock
 'He wrote a/the letter ??at three o'clock.'
- b. Vyhrál^P závod ve tři hodiny. culmination
 win.PAST race at three o'clock
 'He won the race at three o'clock.'
- c. Našel^P klíč ve tři hodiny. happening
 find.PAST keyat three o'clock
 'He found a/the key at three o'clock.'

Another test for distinguishing between incremental events, on the one hand, and culminations and happenings, on the other, is the use of the terminative prefix *do-* that focuses on the final stage of an incremental event. The prefix *do-* cannot be applied to verbs that denote culminations (*vrátit^P se* 'to return' / *vracet^I se* 'to return', 'to be returning') and happenings (*najít^P* 'to find'), because the semantic structure of such verbs does not include a process preceding the point at which they 'culminate' or 'happen'.

- (49) a. Do-psal^P dopis.
 TERM-write.PAST letter
 'He finished writing a/the letter.'
- b. *Do-vracel^P se / *Do-vrátil^P se do Prahy.
 *PREF-return.PAST REFL / *PREF-return.PAST REFL to Prague
- c. *Do-nacházel^P / *Do-našel^P klíč.
 *PREF-find.PAST / *PREF-find.PAST key

The three tests that distinguish verbs denoting incremental eventualities, culminations and happenings are summarized in the following table:

	incremental events	culminations	happenings
imperfective form	+	??	-
time point adverbial	??	+	+
terminative prefix <i>do-</i>	+	-	-

Prefixes and telicity. Slavic verbal prefixes in their role as eventuality description modifiers resemble verbal prefixes in such languages as

German, Dutch and Hungarian, for example, and certain English prefixes and verb particles in phrasal predicates (or verb particle idioms) (see Bolinger, 1971; Dowty, 1979:70-1): e.g., *rewrite*, *underwrite*, *write in*, *write down*, *write up*, *write out*, etc. Consider the following contrasts in English (51) and German (52):

- (51) a. He mopped the floor for ten minutes / ??in ten minutes
 b. He mopped up the floor *for ten minutes / in ten minutes
 c. He was mopping up the floor.
- (52) a. Er schwamm über den Fluss ??in zehn Minuten /
 zehn Minuten lang.
 ‘He swam across the river ??in ten minutes / for ten minutes.’
- b. Er überschwamm den Fluss in zehn Minuten /
 *zehn Minuten lang.
 ‘He crossed the river by swimming in ten minutes /
 *for ten minutes.’

In English, the particle *up* enforces the telic reading of a complex lexical predicate, which is shown in (51a) and (51b) by the change in the acceptability of durative and time-span adverbials. Moreover, (51b) also has a completive entailment, namely, that the denoted event ended when the whole floor was mopped up. Notice that the progressive in (51c) has no completive entailment, in sharp contrast to (51b). Only (51c), but not (51b), can be continued without a contradiction with ‘..., but he did not finish mopping it up.’ (51c) illustrates Comrie’s (1976) observation that English is one of the languages that “have prefixes or verbal particles with, at least sometimes, aspectual (perfective) significance” (p.94).

In German, both (52a) and (52b) denote an incremental event. Only in (52b) the prefix *über-* ‘across’, ‘over’ enforces the telic and completive entailment, it asserts that the end-point of the Path implied by the prefix is reached. In German, this is also true for other prefixed verbs that are not derived with directional prefixes. For example, there is a difference between *schliessen* ‘to shoot (without necessarily aiming at and/or hitting anything)’ and *erschliessen* ‘to kill by shooting’. Similarly, while *kämpfen* means ‘to fight’ possibly without achieving anything, *er kämpfen* means ‘to achieve by means of fighting’.

Such German prefixed verbs and English (non-progressive) phrasal verbs with particles like *up* denote events and have a completive entailment. In this respect, they behave like many prefixed *perfective*

verbs in Slavic languages³¹. The main difference between the German and Slavic prefixed verbs is that only Slavic languages, but not German, have a means of deriving forms with imperfective meaning from prefixed perfective verbs³². In Slavic languages, for example, many perfective verbs have corresponding secondary imperfective counterparts derived with the imperfectivizing suffix *-va-*, as was illustrated by such examples as (31). Slavic secondary imperfectives with the suffix *-va-* are comparable to the combination of phrasal predicates with the progressive aspect like *mopping up* in English, as in (51c). The main difference between the two is that the English progressive has a partitive function, it is mainly used to denote ongoing events, while Slavic secondary imperfectives behave just like other imperfectives in that they are aspectually unmarked and can have a completive meaning in an appropriate context.

Slavic prefixed verbs differ from both the verbal particles in English and prefixes in such languages as German, Dutch and Hungarian (see Zaenen, 1990; Ackerman, 1992, for example) in that the presence of a prefix is not sufficient for contributing the telic interpretation to a sentence into which the prefixed verb is projected. In Slavic languages, if an imperfective verb (both prefixed and unprefixed) takes an Incremental Theme argument, the telicity of a complex imperfective verbal predicate depends on the quantization properties of the Incremental Theme argument. By contrast, in English the presence of a verbal particle determines the telic reading of the complex verbal predicate and it also requires that its Incremental Theme argument be quantized. This requirement is preserved even if the completive ('perfective') entailment is absent, as in the progressive construction: cp. *(*He ate up blueberries, (*He was eating up blueberries (from his plate)* vs. *He ate up the blueberries, He was eating up the blueberries (from his plate)*. ('(*)' indicates that the sentences are acceptable in iterative or habitual interpretation.)

To sum up, perfective and imperfective verbs that are morphologically related differ in (i) aspect (form and semantics); (ii) lexical semantic properties, including a change in the eventuality type. In addition, perfective and imperfective verbs that are morphologically related differ in valence and/or (morphological) case government, which in turn may lead to changes in the grammatical function status of arguments. Let me now turn to this last point.

4.3.6 Argument Structure

Some of the best examples for showing clearly the changes in argument structure induced by morphemes that participate in the formation of perfective and imperfective verb forms can be found in the area of prefixation. A very productive prefixation process involves the derivation of transitive perfective verbs, which denote directed-motion events, from intransitive imperfective verbs, which belong to the class of manner of motion verbs. There are numerous directional prefixes that induce such a predictable change in aspect, lexical semantic properties and eventuality type of verbs. Let us take a simple example (53):

- (53) plavat^{I} (PP/**přes**) → **pře**- plavat^{P} (**přes**) NPacc
 swim.INF (PP/**across**) **ACROSS**-swim.INF (**across**) NPacc
 ‘to swim’, ‘to be swimming’ ‘to swim across NP’
- a. Plaval^{I} (**přes** řeku).
 swim.PAST (**across** river.SG.ACC)
 ‘He swam (across a/the river).’
 ‘He was swimming (across a/the river).’
- b. **Pře**- plaval^{P} (**přes** řeku).
ACROSS-swim.PAST (**across** river.SG.ACC)
 ‘He crossed a/the river by swimming over it.’
- c. ***Pře**- plaval^{P} .
 ***ACROSS**-swim.PAST
 *‘He crossed.’

The simple imperfective verb *plavat* ‘he swam’, ‘he was swimming’ on its own is process-denoting (atelic). It can be optionally combined with a directional prepositional phrase governed by *přes* ‘across’, ‘over’, as in (53a). The prepositional phrase implies an Incremental Path Theme along which the referent of the obligatory subject argument (Holistic Theme) is entailed to move. The combination of a manner of motion verb with a directional prepositional phrase denotes incremental eventualities, that is, it entails a mapping between the part structure of the denoted event and the part structure of the implied Path. Hence, if *both* the Incremental Path Theme and Holistic Theme are quantized, the imperfective sentence to which they make their semantic contribution will be quantized or telic. Otherwise, it will be atelic.

The perfective verb *pře-plavat*^P ‘to cross X (by) swimming’ in (54b) is derived with the directional prefix *pře-* ‘across’, ‘over’ which is related to the directional preposition *přes* ‘across’, ‘over’ (optionally used with the simple imperfective verb). The meaning of the derived perfective verb is predictable from the meaning of the prefix and the imperfective verb root: it denotes a directed-motion event, which is a subtype of the incremental eventuality type.

The prefixation also has an arity-augmenting, transitivity function, whereby the Incremental Path Theme is the obligatory direct object argument, realized in the accusative case. The perfective verb it derives is comparable to English transitive directed motion verbs like *cross (the desert)*, *enter (the room)*. However, the Incremental Path Theme can also occur in the directional prepositional phrase governed by *přes* ‘across’, ‘over’. In both the cases the telicity of a verbal predicate is calculated in the same way on the basis of the quantization properties of the Incremental Path Theme and Holistic Theme.

The lexical entries for the imperfective and perfective verb are given in (54). Due to the fact that morphological processes involved in the formation of perfective and imperfective verb forms are not fully productive, aspect is marked directly in the lexical entries of verbs. Perfective verbs introduce the perfective operator into the semantic description of sentences they head, while imperfective ones introduce the imperfective operator. The feature specification that encodes the perfective meaning of perfective verbs is given as ‘[TOT +]’ in the ‘psoa’ feature structure. ‘[PART +]’ encodes the semantic contribution of the imperfective aspect. The aspect of a lexical head verb determines the aspect of all its projections, including the sentence. (The feature specification ‘lex+’ marks lexical signs. Phrasal signs would be marked as ‘lex-’.) The eventuality type of verbs is also marked in the feature structure ‘psoa’, just as in English. The imperfective verb *plaval* ‘to swim’, ‘to be swimming’ is process-denoting, and hence atelic, the perfective *přeplaval* ‘to cross (by) swimming’ is event-denoting, and hence telic. There are other prefixes with a clear directional meaning that induce the same type of predictable change in aspect, lexical semantic properties and in the argument structure of a derived verb, as is illustrated by the examples above. The above examples also show that in Slavic languages we have a choice in expressing the Path. It can be expressed syntactically with prepositions (53a) or morphologically with prefixes (53b), and these two means of expression of Path can also co-occur (53b)³³.

- (54) Lexical entries for *plavat*^l ‘to swim’, ‘to be swimming’ and *přeplavat*^p ‘to cross X (by) swimming’

PHON	<i>plaval</i>																
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SUBCAT	<[1]NP, [2]NP ∨ [2]PP <i>přes</i> (‘across’)>																				
SEM	<table border="1"> <tr> <td>θ-ROLE</td> <td><e, [1]Holistic Theme,₁, [2]INC-PATH-TH,_j></td> </tr> <tr> <td>CONTENT</td> <td> <table border="1"> <tr> <td>psoa</td> <td> <table border="1"> <tr> <td>e-type</td> <td>incremental event</td> </tr> <tr> <td>aspect</td> <td>[TOT +]</td> </tr> </table> </td> </tr> <tr> <td>PRED</td> <td> <table border="1"> <tr> <td>REL</td> <td><i>swim</i></td> </tr> <tr> <td>SWIMMER</td> <td>i</td> </tr> <tr> <td>PATH</td> <td>j</td> </tr> </table> </td> </tr> </table> </td> </tr> <tr> <td>CONTX</td> <td>[...]</td> </tr> </table>	θ-ROLE	<e, [1]Holistic Theme, ₁ , [2]INC-PATH-TH, _j >	CONTENT	<table border="1"> <tr> <td>psoa</td> <td> <table border="1"> <tr> <td>e-type</td> <td>incremental event</td> </tr> <tr> <td>aspect</td> <td>[TOT +]</td> </tr> </table> </td> </tr> <tr> <td>PRED</td> <td> <table border="1"> <tr> <td>REL</td> <td><i>swim</i></td> </tr> <tr> <td>SWIMMER</td> <td>i</td> </tr> <tr> <td>PATH</td> <td>j</td> </tr> </table> </td> </tr> </table>	psoa	<table border="1"> <tr> <td>e-type</td> <td>incremental event</td> </tr> <tr> <td>aspect</td> <td>[TOT +]</td> </tr> </table>	e-type	incremental event	aspect	[TOT +]	PRED	<table border="1"> <tr> <td>REL</td> <td><i>swim</i></td> </tr> <tr> <td>SWIMMER</td> <td>i</td> </tr> <tr> <td>PATH</td> <td>j</td> </tr> </table>	REL	<i>swim</i>	SWIMMER	i	PATH	j	CONTX	[...]
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According to Talmy’s (1985:104), most branches of Indo-European have Path systems that “use a satellite [e.g., prefix, HF] and a preposition, with the prepositional phrase generally omissible” Talmy (1985:104). This is unsurprising given that the prefix and the prepositional phrase must match in their directional and topological properties³⁴. While

examples like (53b) confirm Talmy's generalization, the following example departs from it in that the preposition cannot be omitted, and yet the prefix *v-* 'in(to)', and the preposition *do* 'in(to)' contribute to the expression of Path and semantically overlap:

- (55) V-běhl^P *domu. / **do** domu.
 INTO-ran.PAST *house / **into** house.SG.GEN
 'He ran into the house.'

Hopper and Thompson (1980) argue that perfectivity is one of the factors that constitutes the cluster concept 'transitivity'. Imperfectivity, on the other hand, is correlated with neutral aspectuality and reduced transitivity. They seem to use aspect both for telicity and grammatical aspect, perfective and imperfective. The intuition behind such correlations is that perfective sentences often denote events with individuals--syntactically realized as direct objects--that are completely subjected to the denoted event. The same holds for English non-progressive sentences with direct objects, such as *John wrote a letter*, *John built a house*. The notion 'a completely affected direct object' is one of the distinguishing characteristics of prototypical transitives. Intuitively, their semantics can be understood in terms of a 'billiard ball model', as Langacker (1986) calls it, which involves two participants that interact in an asymmetric and unidirectional way, whereby one of them is directly affected by some action (possibly involving movement, contact, effect, and the like) instigated or caused by the other participant. In Dowty's terms, this means that the direct object is entailed by the verb to have a high number of Proto-Patient (and a few Proto-Agent) properties, and the subject a high number of Proto-Agent (and a few Proto-Patient) properties.

If we take 'aspect' to be understood in the sense of the grammatical perfective-imperfective distinction, we can observe that the correlation between perfectivity and 'high transitivity' depends to a large extent on whether the verb entails a high number of Proto-Patient properties for its direct object argument, and in particular the Incremental Theme property. So the crucial conditioning factor for with 'high transitivity' is not perfectivity per se, but rather the thematic role assigned to the direct object argument. Let me illustrate this point with the following examples:

- (56) a. Psal^I (dopis).
 write.PAST (letter.SG.ACC)
 'He wrote (a/the letter).' / 'He was writing (a/the letter).'

- (56) b. **Pře**-psal^P dopis. - ***Pře**-psal^P.
OVER-write.PAST letter.SG.ACC - ***OVER**-write.PAST
 ‘He rewrote the/a letter.’
- c. **Pře**-pis-va-^I dopis. - ***Pře**-pis-va-^I.
OVER-write.IPF.PAST letter.SG.ACC - ***OVER**-write.IPF.PAST
 ‘He rewrote the/a letter.’

While all verbs in (56) are transitive, only the simple imperfective verb in (56a) allows for its direct object to be omitted. The application of a prefix *pře-* to an imperfective verb results in a new perfective verb that takes an obligatory direct object linked to the Incremental Theme argument. Both the prefixed perfective verb in (56b) and its secondary imperfective counterpart in (56c) have the same syntactic and semantic argument requirements. Hence, there is no difference in transitivity at these levels of description. The only difference between (56b) and (56c) is in aspect, which in turn triggers different entailments with respect to the direct object *dopis* ‘letter’. In general, a perfective sentence entails that the referent of the Incremental Theme argument is completely subjected to the denoted event. This then can be viewed as one feature of ‘high transitivity’. By contrast, a corresponding imperfective sentence does not have this entailment, which could be interpreted as reduced or ‘low transitivity’ in Hopper and Thompson’s sense. However, the imperfective sentence (57a) does not differ from the perfective sentence (57b) with respect to the extent to which referent of the direct object argument *knihu* ‘book’ is entailed to be affected. Notice also that ‘book’ is not assigned here an Incremental Theme role:

- (57) a. Držel^I v ruce knihu.
 hold.PAST in hand book.SG.ACC
 ‘He held a/the book in his hand.’
 ‘He was holding a/the book in his hand.’
- (57) b. Po-držel^P v ruce knihu.
 PREF-hold.PAST in hand book.SG.ACC
 ‘He held a/the book in his hand.’

Here, the question whether a part of the book or the whole book was subjected to the holding event does not arise. Hence, the perfective sentence (57b) is not correlated with a higher transitivity than the imperfective sentence (57a).

4.4 'Aspect' as a Prototype Category

It has been observed that the English progressive operator can be thought of as expressing the 'part' function (see Bennett and Partee, 1972/1978; Bach 1986; Krifka, 1992, for example). The Slavic perfective operator has been characterized in terms of the 'whole' function. It may be proposed that the semantic core of many, possibly all, aspectual systems can be characterized in terms of the basic mereological notions 'part' and 'whole'. This, however, does not mean that the semantics of various aspect categories, as they are realized in natural languages, is reducible to just these two mereologically based notions and that these two notions are equally applicable to the aspectual systems of all languages. Rather, 'part' and 'whole' are two among several contributing properties that characterize the semantics of the imperfective and perfective categories across languages. Different languages impose different constraints on how the 'part' and 'whole' notions are realized. The constraints are, among other things, related to markedness: that is, which member in the aspectual opposition is the marked one. They are also related to the extent to which a language is verbally oriented or centered around the verb, that is, how much information is carried by verbal forms. Let me explain these points in more detail.

The 'part' function can be used to represent the semantic contribution of the imperfective aspect in languages that have a single category to express imperfectivity as a whole, irrespective of the progressive vs. non-progressive distinction (such as Slavic or Romance languages), and it can also be used to represent the semantic contribution of the progressive aspect in English (which is one of the subcategories of the imperfective). The 'partitive' function requires that a predicate to which it is applied denotes an eventuality that has a certain duration. Only an eventuality with a certain temporal extent can be thought of as having (proper) parts.

The English progressive is the marked member in the progressive vs. non-progressive opposition and it is used to map (sets of) eventualities into their *proper parts*. That is, in asserting *Max was crossing the street*, for example, the speaker explicitly excludes the final part of the denoted event, namely, that subpart that has Max on the other side of the street. Hence, the 'part' function involved in the English progressive operator can be understood in terms of the proper part relation '<', a strict partial ordering. (See also section 2.5.2.)

Non-progressive base predicates are unmarked in this respect, they can be used for whole completed events, as in *Max crossed the street*. They typically are not used for the expression of proper parts of eventualities, that is, with functions and in contexts in which marked progressive predicates occur³⁵.

In addition to expressing the ‘proper part’ function, the progressive operator requires that predicates and sentences in its scope be episodic, denote some ‘temporary’ or ‘contingent’ property (see Comrie, 1976; Carlson, 1977; Bach, 1981; see also Timberlake, 1982; Smith, 1985. See also 4.2.2.1 above)³⁶. Static state (or individual-level) predicates like *know* and *believe* are extended in time, but they typically predicate an unchangeable, permanent property of some individual. Such predicates do not usually occur in the progressive (except with special interpretations), as they are not easily represented in terms of their proper parts. That is, as Bach (1981) suggests, following some proposals in Carlson (1977), “a progressive verb phrase denotes the property of being an individual such that there is a manifestation (or realization) of that individual of which the basic predicate holds. In mereological terms we can identify the manifestation of an individual with some temporally limited proper part of the individual” (Bach, 1981:78). For example, *be a hero* expresses a property (a disposition or a potential) that holds of an individual. The corresponding progressive predicate, as in *John is being a hero (by standing still and refusing to budge)* (see Dowty, 1979:185) expresses a temporary eventuality ‘be acting / behaving in an heroic way’ that counts as a temporary manifestation of the disposition expressed by the basic non-progressive predicate *be a hero*. The crucial point is that the denotation of the static predicate is here reinterpreted as a contingent, temporary property in the scope of the progressive operator.

Given the wide range of contextually-determined uses of imperfective verbs in Slavic languages like Czech, I propose that the partitivity involved in the imperfective operator is here best understood in terms of the relation ‘part-of-or-equal’, or part relation ‘ \leq ’. (Every entity is a part of itself.) The part relation ‘ \leq ’ is a weak ordering relation. (See also section 2.5.2.) In the Slavic perfective vs. imperfective opposition, the imperfective member is unmarked. (See above section 4.3.3.) One of the reasons is that imperfective verb forms can be used to denote incomplete (partial) eventualities and also complete events. The perfective aspect is the marked member in the aspectual opposition, as perfective verb forms denote only complete events. Hence, they are quantized and episodic³⁷. It has been proposed (section 4.3.3.1) that the perfective operator expresses a function that maps (sets of) eventualities

into events represented in their entirety, as integrated wholes. Depending on the idiosyncratic lexical semantic properties of a given perfective verb, the assertion expressed by perfective sentences concerns the attainment of the inherent final delimitation of the denoted event ('completion', 'result'), completed transition into a state, event or process ('inchoation'), or an event of a certain duration (short, long, punctual). (See section 4.3.3.1.)

The notion of 'partitivity' and 'extension along the temporal axis' (which 'partitivity' presupposes) are sufficient and necessary for the characterization of the Slavic imperfective. Unlike the English progressive operator, the Slavic imperfective operator does not require that the predicate in its scope denote a dynamic, temporary eventuality. As has already been observed above, static verbs in Czech (and in other Slavic languages) are imperfective. Modal verbs and other verbs for which the perfective-imperfective opposition is neutralized (so-called 'imperfectiva tantum') are also imperfective. Such verbs attribute 'atemporal' properties to individuals.

To sum up, the marked members of the aspectual oppositions in English and Czech, the progressive and the perfective aspect, respectively, can be semantically characterized in terms of the clusters of the following properties:

- (59) The PROG operator is a function that maps
eventualities into their proper parts.
Necessary constraints on the input predicate P:
P denotes sets of dynamic ('temporariness', 'contingency')
and protracted ('extension along the temporal axis')
eventualities.
Additional elaborations: manifestation of a disposition,
potential for an imminent change,
incremental change, etc.
- (60) The PERF operator is a function that maps
(sets of) eventualities into (sets of) events represented in
their entirety, as integrated wholes.
Necessary constraints on the input predicate P:
P denotes sets of dynamic ('temporariness', 'contingency')
eventualities.
Additional elaborations: result, completion, limited duration,
punctuality, etc.

The clusters of concepts that characterize the Slavic perfective and the English progressive aspect can be viewed as characterizing two prototypical members of the perfective and imperfective category, respectively³⁸. The prototype view presupposes that perfective and progressive predicates (and sentences) each express clusters of non-discrete concepts or aspectual properties. The systematic expression of aspect in any given language can be understood as realizing at least the 'part' and/or 'whole' function and possibly some of the other properties and constraints that contribute to the 'progressive' and 'perfective' prototypes. The more of these properties and constraints are grammaticalized in a given language-specific aspectual category, the closer it will be to these two prototypes.

The prototype view of aspect has the advantage that it does not presuppose that there is any one set of universal concepts that are equally applicable to all languages (see also Dahl, 1985). It does not also imply that the aspect category in a given language is necessarily reducible to a single semantic 'invariant' property (or a pair of such properties), contrary to the structuralist approaches to aspect.

Moreover, if we assume that the mereological notions of 'part' and 'whole' constitute the semantic core of aspectual systems in natural languages, we can also describe in a straightforward way the parallels between various aspectual systems regardless whether the relevant aspectual notions are expressed by means of verbs or some periphrastic verbal constructions or by means of nouns, noun phrases and various constructions with a locative or partitive origin, as in Finnish and German, for example. (See more on this point in chapter 6.)

Finally, if we assume that the notions of 'part' and 'whole' constitute the semantic core of perfective and imperfective aspect in natural languages, we can represent the semantics of the 'grammatical' aspect (perfective, imperfective) and 'lexical' aspect (telic, atelic) by means of the same mereologically-based apparatus. Recall that in chapter 2 it has been argued that at least some of the properties of the telic and atelic verbal predicates and sentences can be described in mereological terms. Such a mereologically-based characterization of 'grammatical' aspect and telicity has the advantage that it allows us to describe in a straightforward way their integration into sentence's semantics. 'Grammatical' aspect interacts in a systematic way with telicity and an adequate description of aspect must account for this systematic interaction.

Notes

1. The importance of the Slavic aspectual systems in discussions of aspect in general linguistics has to a large extent to do with the history of the aspect research. The term ‘aspect’ appeared in English for the first time in 1853, according to the Oxford English Dictionary (see Binnick, 1991:135). The term itself was imported into the Western grammatical tradition from the study of Slavic grammar in the early nineteenth century. The term ‘aspect’ is a loan translation from the Slavic. The Slavic term ‘vid’ is etymologically cognate with the words ‘view’ and ‘vision’, while the etymological root of aspect is *spect-* which means ‘see, look (at), view’ (cp. *prospect, inspect, spectacle*, etc.). The term ‘vid’ first appeared in an early seventeenth century work by Meletiy Smetritskiy (see Binnick, 1991:139). The view of aspect as consisting in the opposition of perfective and imperfective can be traced back to Miklosich’s *Vergleichende Grammatik der slavischen Sprachen* (Comparative Grammar of the Slavic Languages) of 1868-74. This modern concept of aspect became established through the work of Jakobson (1932, *Zur Struktur des russischen Verbums* - On the Structure of the Russian Verb).

2. Under a habitual interpretation of *Max is crossing a street* it may follow that *Max has crossed a street* (on some other occasion). (See also Dowty, 1979:61.)

3. Cf. Dowty’s (1979) criticism of Taylor’s account that assumes Davidsonian ‘extensional’ semantics as being “in principle unable to accommodate the modal treatment of the progressive I have proposed, and does not present any solution to the imperfective paradox” (Dowty, 1979:166).

4. Landman (1992:11) suggests that “[w]e could capture this by introducing a notion of inertia world that is not only indexed for a world and an interval (as it is in Dowty’s theory), but also for an event, as well.”

5. According to Taylor (1977), the function of the progressive is “to mark the presence of time *t* (typically a moment) which, *though not itself a time of application of the tensed verb*, occurs within a more inclusive time which is a period of the verb’s application” (Taylor, 1977:206). By the time of ‘application of a verb *P*’ Taylor means the time at which the atomic sentence *P(x)* is true, as opposed to the time at which the tensed sentence is true. In contrast to non-stative sentences, statives can be true at a moment of time and they can occur in simple present tense sentences with point adverbials. Given these properties of stative predicates, Taylor explains the fact that stative verbs usually do not occur in the progressive construction

in the following way: “every time within a period of application of such a verb itself being a time of its application, there is no place for tenses designed to register the existence of times of non-application of the verb within broader periods of its application” (Taylor, 1977:206). In other words, the progressive form marks the presence of time *t* (typically a moment) and it also marks that the corresponding simple sentence is not true at *t*.

6. In Carlson (1977), the progressive auxiliary *be* combines only with verb-phrases that represent properties of stages but not with those that represent properties of individuals. This is done by sorting: *be* is only defined for the appropriate kind of property. This treatment of the progressive presupposes the distinction between individual-level and stage-level predicates. It can be roughly described as a distinction between predicates that hold more or less permanently or that can be predicated atemporally of their arguments and predicates that are episodic, namely those predicates that Carlson analyzes as applying to a spatio-temporal slice of an individual. The distinction between individuals and their temporally restricted stages can be illustrated with adjectival predicates: *tall*, *intelligent*, *sane* apply to individuals and *drunk*, *present*, *sick* to their temporary manifestations. The notion of ‘stage’ is crucial in Carlson’s framework for giving a formal account of the difference between stative verbs (like *love*) which do not normally allow the use of the progressive, and non-stative verbs (like *run* and *build*) which do.

7. Mourelatos (1981:197) claims that the distinction between activities and accomplishments is marked morphologically by the use of the progressive forms and their absence, respectively. That is, “regardless as to whether a mile is or fails to be run, any substretch of running-a-mile activity divides homogeneously into substretches of the same” (Mourelatos, 1981:197).

Bennett (1981:15) proposes that “the progressive always describes an activity”. This is reflected in his work by the requirement that the truth conditions for the progressive be defined with respect to an open interval. The open interval condition should guarantee that “*Jones is leaving* neither implies *Jones has left* nor *Jones will have left*, because we cannot conclude from *Jones is leaving* that a performance of leaving has, or will have, taken place” (Bennett, 1981:15).

8. See Isačenko (1962:350-81) for a detailed discussion of the morphology of the aspect system of Slavic languages (especially Russian). A brief historical discussion can be found Forsyth (1970.)

9. Originally, the suffix *-va-* had a habitual meaning.

10. In Slavic conjugational systems a verb typically consists of a root morpheme followed by a conjugational marker that is often referred to as a ‘theme’ or ‘extension’ (see Spencer, 1991:11, 195).

11. In languages where the basic tense distinction is between past and non-past, we have strictly speaking not the possibility of a perfective present, but rather of a perfective non-past, i.e. of the perfective of the present-future” (Comrie, 1976:66).

12. According to Dahl (1985), “[t]here is strong tendency for PFV [perfective] categories to be restricted to past time reference. (...) In other words, for all languages it holds that ‘past time reference’ characterizes prototypical uses of PFV - single, completed events will in the ‘typical cases’ be located in the past. Languages will differ, however, in the extent to which they allow uses of PFV with non-pasttime reference. Also, within one and the same language, the ‘past time reference’ restriction may hold with unequal force in different contexts” (Dahl, 1985:80). “Thus in many Indo-European languages, and also in Georgian, the difference between the Aorist and the Imperfect exists only in the Past Tense, and there is no corresponding distinction in other tenses ...” (Comrie, 1976:71). Among languages that do not restrict their perfective category to past time reference, are Slavic languages, Japanese, Modern Greek and some Bantu languages, e.g. Zulu and Sotho” (Dahl, 1985:80).

13. In many cases we have here what is labeled in standard grammar manuals as a ‘simple completion of an event’ (*prosté dokonání děje* in Czech, see Petr et al., 1986, Vol.1, for example).

14. For the corresponding prefixes in Russian, the connotations of the accumulative *na-* are paraphrased in Isačenko (1960:246) with *vdóvol’* ‘in abundance’, ‘enough’; *do krájnosti* ‘to the extreme’, *vlast’* ‘to one’s heart’s content’, ‘as one likes’.

15. Krifka (1997) defines ‘maximal separated entity’ as follows:

a. $MS(P)(x)$, x is a maximal separated entity of type P if $P(x)$, and for all y with $P(y)$ and $x < y$, it holds that every z with $z < y$ and $\neg x \otimes z$ is not adjacent to x . (Where ‘ \otimes ’ is the overlap relation: $x \otimes y \leftrightarrow \exists z \in U [z \leq x \wedge z \leq y]$.)

b. Standardization: $MS\#(P)(x) = 1$ if $MS(P)(x)$

Generalization: $\forall x, y [\neg x \otimes y \rightarrow MS\#(P)(x \oplus y) =$

$MS\#(P)(x) + MS\#(P)(y)]$.

(Where ‘ $\#$ ’ is the atomic number function, a kind of extensive measure function: If $At(x)$, then $\#(x) = 1$; if $\neg x \otimes y$, then $\#(x \oplus y) = \#(x) + \#(y)$.)

16. Forsyth’s (1970:8) characterization of the perfective aspect is based on Razmusen (1891) and Maslov (1959) and on the view of aspect as a privative opposition: “... a perfective verb expresses the action as a total

event summed up with reference to a single specific juncture". Dahl (1985), for example, gives the following characterization of the perfective aspect along these lines: "A PFV verb will typically denote a single event, seen as an unanalyzed whole, with a well-defined result or end-state, located in the past. More often than not, the event will be punctual or, at least, it will be seen as a single transition from one state to its opposite, the duration of which can be disregarded" (p.13). Comrie (1976:16) sums up the 'totality' characterizations of the perfective aspect in the following way: "... perfectivity indicates the view of a situation as a single whole, without distinction of the various separate phases that make up that situation, while the imperfective pays essential attention to the internal structure of the situation."

Notice that the other frequently cited characterization of the semantics of the perfective-imperfective distinction that Comrie also draws upon may lead to a confusion with the category of 'tense': "aspects are different ways of viewing the internal temporal constituency of a eventuality (...) the imperfective looks at the eventuality from inside (...) the perfective looks at the eventuality from outside" (Comrie, 1976:3-4). At the same time, the difference between aspect and tense can be stated as the difference "between eventuality-internal time (aspect) and eventuality-external time (tense)" (Comrie, 1976:5). The problem here lies with the possible confusion of "looking at the eventuality from outside" (perfective aspect) with "eventuality-external time" (tense).

17. For more details on the topological notion of 'limit' and 'boundary' in the characterization of the semantics of the perfective aspect in Russian see also Dahl (1985:76).

18. Jakobson formulated this concept of 'privative opposition' in the following way: "A linguist, in considering a pair of contrasting morphological categories, often starts from the assumption that both categories have equal rights (*seien gleichberechtigt*) and that each possesses its own positive meaning: category I has the meaning A, and category II the meaning B; or at least, that I means A, and II expresses the lack or negation of A. In fact the general meanings of correlative categories are distributed in a different way: if category I expresses the presence of meaning A, then category II does not express the presence of meaning A, i.e. it does not state whether A is present or not. The general meaning of category II compared with category I is limited to the absence of 'A-indication'. If in a given context category II expresses the absence of meaning A, this is merely one of the uses of the category in question: the meaning is here conditioned by the eventuality, and even if this meaning is the most common function of this category, the investigator nevertheless must not equate the statistically predominant meaning of the category with its general meaning ... (...). By

regarding as an essential relationship something which within the system of the language merely has the status of a possible relationship, grammarians end up by making rules with a great number of exceptions” (Jakobson, 1932, translation by Forsyth, 1970:7).

19. Morphological markedness theory requires the identification of this distinctive feature. The goal in Slavic structuralist aspectology based on the markedness theory of Jakobson was for many years to find this distinctive feature that represents the invariant meaning that is supposed to cover all the contextual variants and to hold for all the verbs of the system regardless of their lexico-semantic class. The invariant distinctive feature is not merely a descriptive summary of contextual variation, rather it is a primitive element of grammar. Structuralism claims that the invariant values of categories are central and primary, while the semantic properties these categories encode are peripheral and secondary. The existence of the invariant meaning was also a crucial argument for the claim that aspect is a grammatical category.

20. In a similar vein, Forsyth (1970) observes that the ‘general factual’ or ‘simple denotative’ use of the imperfective “... is such a common use of imperfective (...) it can in fact be argued that this is the essential and only inherent meaning of the imperfective, from which the other ‘meanings’ mentioned above are derived” (Forsyth, 1970:6).

21. Notice that the same relation in Russian and in English is lexicalized: Russian has *lovit^l* - *pojmat^p* and English *chase* - *catch*.

22. On the other hand, according to Isačenko (1962), secondary imperfectives cannot be semantically identical to the simplex bases. If they were semantically identical to the corresponding base verbs, why would Russian derive them in the first place?

23. Flier (1977:224) observes that “[t]he prefix *po-* is often considered the perfectivizing prefix par excellence, and understandably so; its feature hierarchy traces the inceptive, lateral, and terminal limits of a domain, thus likening it to +PERFECTIVE in its totalizing role. The two must not be confounded, however. Verbs with *po-* are not necessarily perfective.”

24. Cf. J. Petr et al., 1986. *Mluvnické Češtiny. Part I* (‘Grammar of Czech. Vol. I’). Praha: Academia. p. 396.

25. The German term ‘Aktionsart’ means ‘a manner of action’. In Russian linguistics, the corresponding term is *sposoby dejstvija*. The use of the term ‘Aktionsart’ for the lexicalization of various ‘manners of action’ by means of derivational morphology goes back to Agrell (1908). The notion of ‘Aktionsart’ has recently been extended beyond the narrow, morphologically based, understanding (see Hoepelman, 1981; Hinrichs, 1985; Zaenen, 1989; Vetters and Vandeweghe (eds.) 1990; Legendre, 1991; Wechsler, 1991, among others). It has been used for the distinctions that

underlie the typology of eventuality types introduced by into modern linguistics Vendler (1957/1967) and Dowty (1972, 1979). (See chapter 2.)

26. By comparison, there have been many more attempts to provide similar typologies for Russian (see Hoepelman, 1981, Brecht, 1985, Timberlake, 1985, among others).

27. Unlike in Russian, for example (see Isačenko, 1962:405-7; Comrie, 1976:27; Kučera, 1981:177), in Czech this derivation process is very productive and such derived habitual verbs can be found in all the styles of speech (see Kučera, 1981:177). The suffix *-va-* may be repeated for emphasis, which gives rise to a set of expanded verbs: *psát* 'to write', 'to be writing' → *psá-va-t'* 'to write habitually, often, frequently, etc.' → *psá-vá-va-t'*. For analyses of habitual verbs in Czech, see Kučera (1981), Filip (1993, 1994), Filip and Carlson (1997).

28. However, there are exceptions, namely underived or primary perfective stems, as in *dát* 'give'.

29. A similar situation is common in other languages as well. For example, Comrie (1976:116) mentions that some stative verbs in Georgian lack the distinct aorist and imperfect forms in the past tense, instead they have just one form whose meaning is primarily like that of the imperfective of other verbs.

30. Notice that there is an imperfective verb *spatřovat'* that does not express visual perception, but rather is used as a verb of psychological state: *Spatřoval' v tom svou povinnost* [see.PAST in that his duty] 'He considered it as his duty.'

31. German examples like those given in the above paragraph led Jacob Grimm and other German philologists in the 19th century to extend the notion of 'aspect' from Slavic languages to Germanic languages. Streitberg, for example, observes, "[i]t is not impossible to find in the Germanic languages also the traces of a distinction which so permeates the Slavic languages. Composites with *ver-*, *be-*, *hin-*, *durch-*, etc. (as in Slavic with *po-*, *do-*, *na-*, etc.) perhaps represent perfectives, uncomposed verbs on the contrary imperfectives" (Streitberg, 1891:77).

32. "At an early stage in the development of the Slavonic languages, it is probable that prefixing a simple verb did not in itself lead to perfectivisation, and Modern Russian still contains a number of prefixed simple verbs without perfective meaning, often borrowed from Old Church Slavonic, the earliest attested Slavonic language, e.g., *pred-videt'* 'foresee', *so-stajat'* 'consist'. Subsequently, certain prefixal usages came to be interpreted as specifically perfective, although the opposition Perfective/Imperfective was certainly not yet a fully developed system offering two aspectual forms for all (or nearly all) verbs, so that those verbs

that did not have specifically prefixed forms had no specifically Perfective forms” (Comrie, 1976:89).

33. With regard to verbs of motion, Talmy (1985) proposes that Germanic and Slavic languages conflate motion and manner in a simple verb and independently mark the Path by means of prefixes or prepositional phrases. In this respect they differ from the Romance and Semitic type of conflation of motion and path with independent marking of manner. (See also fn. 25, chapter 3.)

34. Directional prefixes incorporate motional and topological constraints that are reflected in the selectional constraints of prefixed verbs on Incremental Theme arguments. For example, the prefix *pře-* ‘across’, ‘over’ requires that the referent of the Incremental Theme argument (can) be (viewed as) a one-dimensional point or a two-dimensional surface. It indicates a directed motion along a path that leads across or over it. The prefix *po-*, as in *Pomalovař stěny bílou barvou* - ‘He covered the walls with white paint’, contributes the meaning of ‘covering or filling’ and requires that the referent of the Incremental Theme argument be a two-dimensional surface.

35. In certain discourse types, such as reports of on-going sports events, simple forms can be used instead of progressive forms: *He shoots - he scores!*

36. According to Timberlake (1982:311), “the metrical parameter of durativity must be distinguished from the topological parameter of progressivity” (Timberlake, 1982:315). (...) “the progressive requires change on the activity dimension. The progressive, then, expresses dynamicity with respect to the aspect locus at the propositional level”.

37. There are some exceptions, such as perfective verbs like *unést* ‘to be able to carry’ and some other perfective verbs.

38. Some support for this view can be seen in the first language acquisition studies of Slobin. According to the developmental sequence that Slobin proposes, children first use grammatical markers to differentiate “extreme” categories of meaning; later they discover which semantic properties of these extremes are critical for their language, and they determine how these properties interact with other properties to define (in this case) a language-specific tense-aspect system. For example, the English-speaking child must learn to mark events in the past differently depending on whether he views them as ongoing, without information about their beginning or end, but not on the basis of whether he views them as completed and culminating in some resultant state: cp. *He was fighting* vs. *He fought*. By contrast, the Polish-speaking child “will have to attend to completion (perfective aspect) but not the ongoing progress of a past event” (Slobin, 1985:1184). “Basic Child Grammar orients to two major

temporal Perspectives, which we can characterize as Result (punctual, completive) versus Process (nonpunctual, noncompletive, ongoing). This distinction is marked early on by the perfective-imperfective forms of verbs in Slavic languages, by the present (*-Iyor*) - past (*-dl*) forms in Turkish, by the progressive-past forms in English (*-ing* vs. *-ed*) and Japanese *-te iru* vs. *-ta*, etc. (...)" (Slobin, 1985:1183-4).