CLS 28

Papers from the 28th
Regional Meeting
of the Chicago Linguistic Society
1992

Volume I: The Main Session

compiled and edited by

Costas P. Canakis
Grace P. Chan
Jeannette Marshall Denton

CONTENTS

Physiological Constraints on Two-Finger Handshapes

Jean Ann
University of Arizona

0. Introduction

Two recent proposals for handshape features for American Sign Language (ASL) include the five features, given in (1), each named for a finger (Corina and Sagey, 1988; Sandler, 1989). This approach seems reasonable because the fingers can act relatively independently in signs. Therefore, the features in (1) allow any finger to be used in a handshape.

1.   [T] for thumb
        [I] for index
        [M] for middle
        [R] for ring
        [P] for pinky

However, since neither proposal places any restrictions on the combinations of the features in (1), they both predict that features can combine freely in handshapes. This prediction seems doubtful when the physiology of the hand is considered. This paper examines the "two-finger" handshapes of Taiwan Sign Language (TSL) and ASL. The data shows that the physiology constrain which features can combine.

The organization of this paper is as follows: in section 1, I explain the necessary background about handshapes. In section 2, I provide the TSL and ASL data and explain the generalizations. In section 3, I explain the physiology of the hand relevant to the generalizations. In section 4, I show how the physiology explains the generalizations discussed in section 2. Finally, in section 5, I conclude that handshape feature theories should reflect an understanding of the physiology such that unattested handshapes are not predicted.

1. Background on Handshape

Handshape refers to the configuration of the five fingers. For example, fingers can all be in one "group" as in (2), in which all the fingers are closed to the palm.

2.

However, all fingers do not necessarily behave the same way in handshapes: there can be two "groups" of fingers as in (3).

REFERENCES

Bellugi, U.: 1967. The acquisition of negation. Unpublished PhD Dissertation, Harvard University.

Bloom, L.: 1970. Language development: Form and function in emerging grammars. Cambridge: MIT Press.

Brown, R.: 1973. A First Language. Cambridge: Harvard University Press.

Deprez, V. and A. Pierce: 1990. Negation and functional projections in early grammar. ms. Rutgers and UPENN.

Drozd, K.F.: 1992. Categorial complexity and the acquisition of negation. Ph.D. Dissertation, University of Arizona, Tucson.

Horn, L.R.: 1989. A natural history of negation. Chicago: University of Chicago Press.

Klima, E. and U. Bellugi: 1966. Syntactic regularities in the speech of children. In Lyons, J. and R.J. Wales (eds.) Psycholinguistics papers. Edinburgh: Edinburgh University Press.

Lebeaux, D.: 1988. Language acquisition and the form of the grammar. Ph.D. Dissertation, UMASS:Amherst.

MacWhinney B.: 1991. The CHILDES Project: Tools for analyzing talk. Hillsdale, NJ.: Lawrence Erlbaum.

Radford, A.: 1990. Syntactic theory and the acquisition of English syntax. Cambridge: Basil Blackwell.

ASPECT AND INTERPRETATION OF NOMINAL ARGUMENTS[*]

Hana Filip

University of California at Berkeley

1. In Czech, and in other Slavic languages, the lexical-derivational operators that are applied to a verb can extend their semantic effects over a particular nominal argument. Such effects are often comparable (i) to those of articles and also (ii) to those of determiner quantifiers, and various quantifying and measure expressions. This can be best shown with determinerless NPs that are headed by common nouns, in particular mass and plural nouns. This analysis of the interaction between verbal and nominal predicates in Czech builds on recent suggestions by Partee, Bach & Kratzer (1987), Partee (1990) and (1991) who explore the use of verbal affixes to express various kinds of quantificational or closely related meanings. Although there are many other contextual factors that determine the interpretation of determinerless NPs with common noun heads in Czech, my analysis focuses on the role played by verbal aspect in connection with Incremental Theme role (cf. Krifka 1986; 1987; 1989; Dowty 1988; 1991), a semantic role that motivates the telic/atelic distinction (Aktionsart) of complex verbal expression. I propose that in Czech the lexical-derivational operators that are applied to a verb direct their semantic effects at an Incremental Theme argument.

2. In order to describe quantification in natural languages, Partee, Bach and Kratzer (1987) suggest that we distinguish two main syntactic classes: D-quantification and A-quantification. D-quantification is typically expressed in the NP with determiner quantifiers (*every, most*). A-quantification is a heterogeneous class and it subsumes a variety of phenomena expressed at the level of the sentence or VP with sentence adverbs (*usually, always*), "floated" quantifiers (*each*), auxiliaries, and verbal affixes, for example. Partee (1990:19) suggests that we distinguish the two following subclasses:

(i) "true A-quantification, with unselective quantifiers and a syntactic basis for determining, insofar as it is determinate, what is being quantified over, and

(ii) lexical quantification, where an operator with some quantificational force (and perhaps further content as well) is applied directly to a verb or other predicate at a lexical level, with (potentially) morphological, syntactic, and semantic effects on the argument structure of the predicate" (Partee 1990:19).

D-quantification and A-quantification are associated with different quantificational ontologies. D-quantifiers primarily quantify over individuals and A-quantifiers over times or events. However, D-quantification and A-quantification are often interchangeable from a truth-functional point of view, as in many English examples with *every* and *always*, for example (cf. Partee 1991:10 and 12).

In many languages A-quantifiers that are incorporated in verb morphology direct their semantic effects at nominal arguments. Consider, for instance, the following Warlpiri example with the partitive preverb *puta-*:

(1)

Ngapa	*O-ju*	*puta-nga-nja.*
water	AUX-1sg	PART-drink-IMP

'Just drink some (not all) of my water!'

Puta- can be interpreted as modifying the verb, with meanings like 'V incompletely/unsuccessfully/part of the way' or 'nearly V'; when the verb has an object which admits a 'part of' interpretation, then the interpretation can be something like 'V which admits a 'part of the Obj(s)', "which we should probably regard as only some Objs' or 'V only some of the Obj(s)'", "which we should probably regard as just one way to 'V Obj incompletely', not as a separate reading" (cf. Partee 1990:18).

A similar interaction between verb morphology and nouns can be also observed in Slavic languages. In Czech, various lexical-derivational V^0-modifiers have a dual function of coding aspect and Aktionsart. The aspectual 'perfective (P)-imperfective (I)' distinction is coded by prefixation (*psát* 'to write' - *pře-psat* 'to write over/again'), suffixation (*otrahat* - *otrahd-va-t* 'to pick'), change of the stem extension (*skákat* 'to jump, i.e., to be jumping' or 'to jump repeatedly' - *skočit* 'to jump') or suppletion (*brát* - *vzít* 'to take'). The overwhelming majority of Slavic verbs can be classified as either perfective or imperfective.[1] Apart from their aspect coding function, many V^0-modifiers also have effects on the lexical semantic properties of verbs that have been described under the notion of 'Aktionsart' (German term meaning 'a kind of action') in Slavic and Germanic linguistics. These effects are often characterized by such quantificational notions as 'iterativity', 'semelfactivity', 'distributivity', or by notions that are closely related to quantity and measure (cf. Isačenko 1960 and 1962, for example). This narrow, morphologically based, notion of 'Aktionsart' partly overlaps with a broad sense of 'Aktionsart' that has more recently been used for the distinctions not only on the level of lexical semantics of individual verbs, but also on the level of VP and sentences. It comprises Vendler's (1957; 1967) classes 'state', 'activity', 'accomplishment', 'achievement' (cf. Hoepelman 1981, Hinrichs 1985, among others) or the corresponding 'telic-atelic' distinction that was coined by Garey (1957).

Semantic distinctions expressed by verbal predicates, and primarily designed for conveying distinctions in the domain of events, may also have semantic effects on the interpretation of nominal predicates. Czech, like most other Slavic languages, does not have an overt article system. The semantic differences that are carried by articles in English, for example, are here inferred through, or expressed by, a variety of morphological, syntactic, prosodic and lexical devices: word order, stress, determiner quantifiers, function words and various other lexemes that modify nouns. What has been less frequently noticed, let alone systematically described, is the influence of verbs on the interpretation of nominal arguments.[2] This influence can be best illustrated in transparent contexts with examples that contain determinerless NPs that are headed by mass and plural nouns, as is illustrated by the pair of sentences in (2) and in (3):

(2-a)
Pil^I kávu.
drank-3SG-MASC   coffee-ACC
'He was drinking (some) coffee.'

(2-b)
Vypil^P kávu.
PREF-drank-3SG-MASC   coffee-ACC
'He drank up (all) the coffee.'

(3-a)
Pletla^I svetry.
knitted-3SG-FEM   pullovers-PL-ACC
'She was knitting pullovers.'

(3-b)
Upletla^P svetry.
PREF-knitted-3SG-FEM   pullovers-PL-ACC
'She knitted (all) the pullovers.' [i.e. she finished knitting all the pullovers.]'

Each pair of sentences in (2) and (3) only differs in their main verbs: the imperfective sentences (2a) and (3a) are headed by simple imperfective verbs, and the perfective sentences (2b) and (3b) by the corresponding prefixed perfective verbs. Even though mass and plural NPs do not have referents with inherent boundaries, in (2b) and (3b), the mass NP 'coffee' and the plural NP 'pullovers' are understood as *bounded*. In the most natural interpretation of (2b) and (3b), their DO-NPs refer to a contextually *specific* or *known* portion of coffee and to a *specific* set of pullovers, rather than as denoting coffee and pullovers, in general. In other words, the use of determinerless NPs with mass and plural noun heads here corresponds to the referential use of definite descriptions in languages that have a definite article. They *must* be translated with the definite article *the* into English. In Bulgarian, for example, that combines both the Slavic aspectual system with a partially realized article system, the use of an enclitic definite article is obligatory in the corresponding perfective sentences:

(4-a)
Toj   izpi^P *kafe / kafeto.
he-NOM   PREF-drank-3SG-MASC   *coffee-ACC/ coffee-DF.ACC
'He drank up (all) the coffee.'

Since both (2b) and (3b) also have an *all-inclusive* or *holistic* entailment with respect to their DO arguments 'coffee' and 'pullovers', that is, they entail that the denoted event ended when the Agent finished drinking all the available coffee and knitting all the pullovers, the determiner quantifier *all* may be used in the English translation.

On the other hand, in uttering (2a) and (3a), the speaker asserts that some coffee and some pullovers were subjected to the denoted event. Not only do the DO-NPs in (2a) and (3a) have an *unbounded, partitive* interpretation, but also the identity and quantity of their referents may be irrelevant for the purpose of communication. The use of determinerless NPs with mass and plural noun heads in such simple imperfective sentences as (2a) and (3a) most closely corresponds to English NPs with no articles (or perhaps with the unstressed 'some').

The crucial point illustrated by the pair of sentences in (2) and (3) is that the perfectivizing prefixes and their absence provide the only formal clue as to how the mass and plural NPs are to be interpreted. The most striking examples are those with mass and plural DO-NPs in perfective sentences (2b) and (3b). Such examples clearly show that mass and plural NPs derive their bounded, and referentially specific, interpretation from the perfective verb.

One of the puzzles that needs to be explained concerns such pairs of sentences as those in (5):

(5-a)
Míchala^I jsem   polévku.
stirred-1SG-FEM   AM-AUX-1SG   soup-ACC
'I was stirring (the) soup.'

(5-b)

(5-b)

| Zamíchala[P] | jsem | polévku. |
| PREF-stirred-1SG-FEM | AM-AUX-1SG | soup-ACC |

'I stirred (the) soup.'

(5) shows that some V-modifiers (their uses, to be more precise) have no effect on the interpretation of DO-NPs. Here, the difference in verbal aspect is not correlated with a difference in the interpretation of DO-NPs. If there is any difference in their interpretation at all, it will stem from other contextual factors than just the difference in verb aspect.

Apart from the 'bounded/unbounded' distinction and the difference in referential specificity that was described above, such notions as 'distribution', 'succession', 'iteration', and also 'small quantity', 'large quantity', 'some unspecified bounded quantity', etc. may come into play. For example, while the prefix *vy-* in *vypít*[P] as in (2b) can be thought of as incorporating the 'universal' quantifier 'all' and 'whole', the prefix *na-*, applied to the same simple imperfective verb *pít*[I] 'drink', gives rise to the perfective verb *napít se*[P] and it has approximately the force of unstressed 'some' in English:

(6)

| Napil[P] | se | kávy. |
| PREF-drank-3SG-MASC | REFL | coffee-GEN |

'He drank some (of the) coffee.'[3]

Examples (2a), (6) and (2b), repeated here in the following array

| pít[I] kávu (2a) | NA-pít[P] se kávy (6) | VY-pít[P] kávu (2b) |
| 'to be drinking coffee' | 'to drink some coffee' | 'to drink up (all) the coffee' |

illustrate a common three-way distinction in Czech (and a similar distinction can be also found in Russian and Polish, for example). The left-to-right order here reflects the order in which the specificity of the DO increases in dependence on the quantificational specification encoded by the verb.

The prefix *u-*, applied to the imperfective verb *pít*[I], as in (7)

(7)

| Upil[P] | kávu | (ze šálku). |
| PREF-drank-3SG-MASC | coffee-ACC | (from cup) |

'He took a sip of coffee (from the cup)'[4]

indicates that the DO-NP denotes a small portion of the substance denoted by its head noun. The complex perfectivizing prefix *po-roz* in (8b) illustrates a different case:

(8-a)

| Dával[I] | jim | knihy. |
| gave-3SG-MASC | them-DAT-3PL | books-PL-ACC |

'He was giving them books.'

(8-b)

| Porozdal[P] | jim | knihy. |
| PREF-PREF-gave-3SG-MASC | them-DAT-3PL | books-PL-ACC |

'He gave them (all) the books.'

While (8a) asserts that he was in the process of giving away books, without providing any information in which way, (8b) entails that all the books were gradually distributed,

one after another, among the recipients. In (8b), the DO-NP is not only bounded and referentially specific, but (8b) also has a holistic and distributive entailment with respect to its DO-NP. It seems that such an interaction between V^o-modifiers and nominal arguments as in (8b) can be best thought of as 'lexical quantification' in the sense of Partee (1990:19). The prefix *po-roz* indicates what sort of quantification is involved in the proposition expressed by (8b). Moreover, it expresses a type of quantification that requires a domain restriction and a scope. The nominal argument denotes the kind of individuals the quantification is restricted to range over. In other words, we have here cases in which A-quantification, rather than D-quantification, is used to quantify over individuals.

Two further related facts must be accounted for. First, the interaction between verbal and nominal predicates must be seen in connection with the impact that various lexical-derivational operators have on the syntactic argument structure and semantic interpretation of verbs. For example, the simple imperfective verb *trhat*[I] 'to pick' can realize the Theme argument (what is being picked) as its DO-NP. The Locative argument can only occur as an optional oblique argument:

(9-a)

| Děti | trhaly[I] | jablka | (ze stromu). |
| children-PL-NOM | picked-3PL-NEU | apples-PL-ACC | (from-PP tree-SG-GEN) |

'The children were picking apples (from the/a tree).'

By applying the prefix *o-* to the imperfective simplex *trhat*[I] 'to pick', we derive the perfective verb *otrhat*[P] that can take the Locative argument as its obligatory DO-NP and that does not allow any overt expression of the original DO-NP (what is picked). The derived verb has the meaning 'to remove X completely from Y by picking':

(9-b)

| Děti | otrhaly[P] | strom. |
| children-PL-NOM | PREF-picked-3PL-NEU | tree-SG-ACC |

'The children picked the tree clean.'

And second, V^o-modifiers differ in their scope restrictions or preferences. They may extend their semantic effects not only over DO-NPs, but also over subject-NPs and PPs, both obligatory and optional. In (10), for example, the complex prefix *po-roz-* has the subject in its scope:

(10)

| Jablka | se | porozkutálela[P] | po podlaze. |
| apples-PL-NOM | REFL | PREF-PREF-rolled-3PL-NEU | on floor |

'(All) the apples rolled apart all over the floor.'

The derived perfective verb *po-roz-kutálet*[P] *se* requires a plural subject-NP and its meaning can be characterized as 'to move by rolling, one by one, into different directions (and as a result be at different locations)'.

The account of the impact of verbal predicates on the interpretation of nominal predicates is complicated by the fact that the meaning of a derived verb does not often arise compositionally from the meaning of a V^o-modifier and the verb to which it is applied and the semantic value of a given V^o-modifier often varies considerably depending on the idiosyncratic semantic properties of the verb it modifies. For example, adding a prefix to an imperfective verb yields a perfective verb. Apart from this regular change in aspect, other meaning changes that are induced by prefixation are difficult to predict and have so far escaped any truly systematic and revealing description. It is difficult to

predict for a given prefix what meaning it will assume with different verbs or classes of verbs. For example, while the prefix *u-* has the force of 'small quantity' in *upit* 'to take a sip' (7), it does not have this meaning in *uplést* 'to knit', 'to finish knitting' (3b). Given that there are about twenty prefixes that serve to derive perfective verbs from simple imperfective verbs in Czech[5], in addition to other aspect and Aktionsart coding V^0-modifiers, the task of describing the interaction between verbal and nominal predicates is far from trivial.

In this section, I have shown that verbs may have semantic effects on nominal arguments that are comparable (i) to those of articles and also (ii) to those of determiner quantifiers and various other quantifying and measure expressions. In some of those cases under (ii), this interaction may be best described as 'lexical quantification' in the sense of Partee (1990:19), or, as cases in which A-quantification, rather than D-quantification, is used to quantify over individuals. In what follows I will provide a preliminary analysis of this neglected phenomenon. And in particular, I will address the following questions: (i) When does a given V^0-modifier extend its semantic effects over a particular nominal argument? (ii) At which nominal argument does the V^0-modifier direct its semantic effects? Or, what are the constraints for associating a V^0-modifier that may have a quantificational force with the appropriate argument in its scope?

3. "Although the translations of Warlpiri examples may often make it appear as though a particular argument is being quantified over, Hale believes it is more appropriate to consider these preverbs to be quantifying over whole events, and that the appearance of quantification over arguments follows from the role played by various participants in the events" (Partee 1990:16-7). I propose that the interaction between verbal and nominal predicates in Slavic languages typically takes place in sentences denoting events in which the extent of one participant is intrinsically tied to the individuation and temporal structure of the event itself. By this I mean events like the following one, for example: If somebody mows the lawn, I can conclude something about the progress of this event from the state of the lawn, because the lawn acquires a new property in distinguishable, separate stages, it changes *incrementally* in lockstep with the progression of the mowing event. Dowty (1988; 1991) coins the term 'Incremental Theme' for the thematic role assigned to such NPs as *lawn* in *to mow the lawn*. For Czech, and other Slavic languages, I suggest that the crucial factor in determining at which argument a given V^0-modifier will direct its effects is the following semantic constraint:

(11)

A V^0-modifier extends its semantic effects over the Incremental Theme argument of the predicator that it modifies.

The Incremental Theme role was originally introduced in order to motivate the Aktionsart properties (telicity) of VPs or sentences. For example, in (i) *John drank wine,* the mass Incremental Theme NP *wine* yields an atelic verbal predicate. Whereas in (ii) *John drank a glass of wine,* the measure Incremental Theme NP *a glass of wine* yields a telic verbal predicate. Verkuyl (1972) and Dowty (1972; 1979) introduced this phenomenon into modern linguistics and their pioneering work has been an inspiration to a number of insightful studies. The most explicit and precise account of examples like (i) and (ii) was provided by Hinrichs (1985) and Krifka (1986; 1989). They apply Link's (1983) *lattice-theoretic analysis* of mass and plural NPs to both objects and events and convincingly argue that the explanation for the Aktionsart difference between (i) and (ii) lies in

establishing a homomorphism between algebraically structured Incremental Theme NP and event denotata. Within the lattice-theoretic analysis the domain of events and individuals can be characterized as two non-overlapping sorts of entities, each of which has the structure of a join semi-lattice without a bottom element. Algebraic relations, which characterize a homomorphism, are then defined between the lattice representing the predicates of objects (O) and that of events (E) (cf. Krifka 1986; 1989):

(12-1) *Summativity*:

$\forall R \, [SUM \, (R) \leftrightarrow \forall e, e', x, x' \, [R \, (e, x) \wedge R \, (e', x') \rightarrow R \, (e \cup e', x \cup x')]]$

(12-2) *Uniqueness of objects*

$\forall R \, [UNI\text{-}O \, (R) \leftrightarrow \forall e, x, x' \, [R \, (e, x) \wedge R \, (e, x') \rightarrow x = x']]$

(12-3) *Uniqueness of events*

$\forall R \, [UNI\text{-}E \, (R) \leftrightarrow \forall e, e', x \, [\, R \, (e, x) \wedge R \, (e', x) \rightarrow e = e']]$

(12-4) *Mapping to objects*

$\forall R \, [MAP\text{-}O \, (R) \leftrightarrow \forall e, e' \, x \, [R \, (e, x) \wedge e' \subseteq e \rightarrow \exists x' \, [x' \subseteq x \wedge R \, (e', x')]]]$

(12-5) *Mapping to events*

$\forall R \, [MAP\text{-}E \, (R) \leftrightarrow \forall e, x, x' \, [R \, (e, x) \wedge x' \subseteq x \rightarrow \exists e' \, [e' \subseteq e \wedge R \, (e', x')]]]$

"$\cup$" : the operation of join
"$\subseteq$" : the relation of part

In lattice sorts, we can also specify the cumulative reference property of mass and plural NPs and of atelic verb expressions, activities such as *running*, and states, such as *knowing*. Cumulative expressions pass the additivity test: "(a) If *a* is water and *b* is water, then the sum of *a* and *b* is water" and "(b) If the animals in this camp are horses, and the animals in that camp are horses, then the animals in both camps are horses" (Link 1983:303). On the other hand, singular count NPs (*an apple*), quantified NPs (*five apples*) and measure NPs (*a glass of wine*) and telic expressions (accomplishments like *building a house,* and achievements like *arriving*) are quantized (cf. Krifka 1986; 1989). An expression is quantized if it does not pass the additivity test, or conversely if it is non-divisible: one cannot divide its referent up and get individual parts that can be named by the *same* expression.

This apparatus allows one to map the state of parts of the Incremental Theme NP *a glass of wine* (or *wine*) and their part-whole relationships into the parts of the event of drinking a glass of wine (or wine) and its part-whole relationships. Therefore, since the entity denoted by the Incremental Theme NP *a glass of wine* has a definite extent, the event of drinking of that glass of wine does, as well. Such verbs as *to drink* and *to mow* are said to entail a **Theme-to-event homomorphism** (cf. Dowty 1991:567). Given Krifka's and Dowty's assumptions, we arrive at the following generalization: A quantized Incremental Theme NP yields a quantized (or telic) verbal expression, while a cumulative one yields a cumulative (or atelic) verbal expression. To give a few more examples: In *to eat a sandwich* (consumed object), *to build a house* (effected object) and *to destroy a city* (destroyed object), for example, the measurable property is a decreasing or increasing quantity of the object that delimits the event over time. With verbs that take 'event' objects, such as *to play a sonata*, it is the temporal linear dimension inherent in the object of performance, because it may be realized through performance over time.

Since aspect interacts in a systematic way with Aktionsart, it should not be surprising that the Incremental Theme NP that gives rise to the difference in telicity of complex verbal predicates should also play a role in the interaction between aspect coding verb morphology and nominal arguments in languages like Czech. It might be argued (cf. Krifka 1989:186-189) that the Czech data can be described in essentially the same way as the English examples (i) *John drank wine* and (ii) *John drank a glass of wine*. On this view, such verbs as *to drink* are Theme-to-event homomorphisms in Czech as well. In order to uphold this assumption, two further assumptions are made: First, there is a syntactic rule 'NP → N' that allows two different semantic interpretations, cumulative and quantized. In other words, NPs are ambiguous. Second, perfective operators can be only applied to quantized verbal predicates, while imperfective operators to cumulative ones. Given the Theme-to-event 'transfer' of referential properties, then only with a quantized object the complex verbal predicate will be quantized and with a cumulative object it will be cumulative (cf. also Krifka 1992:50). Notice that such an approach allows one to give a compositional description for the data which does not seem to be compositional.

Following this approach, we see that in (13a),

(13-a)

Jan pil[I]   *viho.*   *Jan vypil*[P]   *viho.*
John drank-3SG-MASC wine-ACC   John PREF-drank-3SG-MASC wine-ACC
'John was drinking wine.'   'John drunk up (all) the wine.'

perfective/imperfective aspect forces a quantized/cumulative interpretation of the complex verbal predicate, and the complex verbal predicate in turn forces a quantized/cumulative interpretation of the Incremental Theme NP. In other words, verb aspect selects the appropriate quantized/cumulative reading of the Incremental Theme NP in a similar way as in *rob the bank* the appropriate reading of *bank* is selected by the lexical meaning of the verb *to rob* (cf. Krifka 1992:50). Now consider example (13b)

(13-b)

Jan   *pil*[I]   *sklenici*   *viha.*
John   drank-3SG-MASC   glass-ACC   wine-GEN
'John was drinking a glass of wine.'

that combines a quantized Incremental Theme NP 'a glass of wine' and an imperfective verb. Intuitively, (13b) makes an assertion about some unspecified subpart of the portion denoted by 'a glass of wine'. On the above approach, this would come out in the following way: the imperfective aspect forces a cumulative interpretation of the complex verbal predicate, and the complex verbal predicate again forces a cumulative interpretation of the quantized Incremental Theme NP 'a glass of wine'. The inherently quantized NP 'a glass of wine' is assigned here a cumulative referential property and due to the Theme-to-event homomorphism it will "transfer" this property onto the complex verbal predicate (cf. Krifka 1986; 1989).

However, this is not quite what happens. First, a perfective operator is not always applied to quantized (telic) verbal predicates and an imperfective operator to cumulative (atelic) ones. For example, there is a class of perfective verbs formed by the prefix *pro-* and *po-*, as in Czech and Russian *postdt, postajat'* 'to stand for a while or *prostdt, prosto-jat'* 'to stand through (some period)', which are best classified as atelic (cf. also Kučera 1983:174). Therefore, we must distinguish between the *bounded* temporal profile associated with the semantics of perfective aspect, on the one hand, and the entailment of a definite change of state inherent in the lexical semantics of *telic/quantized* verbal

expressions (accomplishments and achievements), on the other hand.

If it is assumed that the complex verbal predicate forces a quantized/cumulative interpretation of the Incremental Theme NP, in a similar way as in *rob the bank* the appropriate reading of *bank* is selected by the lexical meaning of the verb *to rob*, then why do we also need to 'transfer referential properties' from the Incremental Theme NP onto the complex verbal predicate? Do we still need the Theme-to-event homomorphism associated with such verbs as *to drink* to motivate the quantized/cumulative interpretation of the Incremental Theme NP? Moreover, if imperfective operators, and presumably also progressive operators as their special case, required cumulative verbal predicates and cumulative Incremental Theme NPs, how would we capture the simple intuition behind what Dowty (1972; 1977; 1979) calls the 'imperfective paradox'? In uttering *John was drawing a circle*, the speaker attaches no existential claim to the Incremental Theme NP *a circle*, because the circle does not exist in its entirety at the relevant reference point, and yet the speaker has the concept of a whole circle, of a whole quantized entity, and consequently of the ultimate potential outcome of the denoted event. On the above account we would have to assume that the NP *a circle* is here cumulative. In short, the two-way distinction between cumulative and quantized expressions does not seem to be sufficient to account for all the relevant data in an adequate way. In particular, it is not clear how we can account for both the Aktionsart and aspect properties of sentences. I propose that in order to account for predications in which a quantized Incremental Theme NP appears in the scope of an imperfective (or a progressive) operator, we need to distinguish between the telic/quantized property of verbal predicates and the unbounded temporal profile associated with the semantics of imperfective aspect.

Moreover, the claim that NPs are ambiguous between a quantized and cumulative interpretation leads to the impression that the interpretation of an Incremental Theme NP as quantized or cumulative is essentially established by a choice within such an NP. The perfective/imperfective aspect then simply selects the quantized/cumulative interpretation of a given Incremental Theme NP. However, this again does not seem to be quite what happens. Rather, what must be emphasized is the fact that the interpretation of an Incremental Theme NP is determined by the aspect of the verb. Moreover, the semantic property of Incremental Theme NPs that is determined by aspect should not be characterized in terms of the 'cumulative/quantized' distinction, but rather in terms of the 'bounded/unbounded' distinction, which characterizes aspect. The 'cumulative/quantized' distinction should be primarily reserved for the inherent properties of NPs and for the inherent lexical semantic properties of verbs, VPs and sentences that are relevant for Aktionsart (telicity).

If we want to capture in a straightforward way the intuition that it is the verbal aspect that determines the interpretation of an Incremental Theme NP in Czech, we cannot at the same time uphold the Theme-to-event homomorphism that Krifka and Dowty associate with such English verbs as *to drink, to mow, to destroy* for the corresponding Czech verbs. The hypothesis that such verbs as *to drink* and *to mow* entail a homomorphism from its (structured) Incremental Theme argument denotations into a (structured) domain of events seems to be motivated, among other things, by two related assumptions. First, it is assumed that thematic roles are functions from individuals into events. And second, as Krifka observes, the laws which govern the influence of the reference type of the NP on the complex verbal predicate depend on the thematic relation the NP bears in the sentence. Therefore, according to him, "this influence can be stated most easily relative to thematic relations" (Krifka 1987:12).

I propose to modify Krifka and Dowty's lattice-theoretic analysis in two important respects and to extend it to the interaction between verbal and nominal predicates in Slavic languages. First, it can be shown that individual verbs cannot often be classified once and for all as denoting a homomorphism, and hence the rules governing the influence of NPs on the meaning of complex verbal predicates cannot be always stated relative to one of the verb's thematic roles. For, if such an influence were to be attributed solely to a particular thematic role, or to an entailment of individual verbs[6], as Krifka and Dowty suggest, then how could we account for the fact that the decision whether a denoted event is understood as evolving in an incremental way, and whether it may also be regarded as telic, often depends on other factors? Various adjuncts (*The truck rumbled* vs. *The truck rumbled from the street into the garage*) and additional arguments (*He sneezed* vs. *He sneezed the napkin off the table*), for example, may play an important role in this decision. Even though Dowty explicitly states that "THE MEANING OF A TELIC PREDICATE IS A HOMOMORPHISM FROM ITS (STRUCTURED) THEME ARGUMENT DENOTATIONS INTO A (STRUCTURED) DOMAIN OF EVENTS, modulo its other arguments" (Dowty 1991:567), it is not clear how the influence of other arguments should be handled. One way in which we could account for the above examples would be to postulate two senses for each predicate, or two different verbs, connected by lexical rules, whereby only one of them would denote a homomorphism. However, such an account would force us to postulate quite implausible senses of verbs. For example, we would have to postulate a special sense of *rumble* in *The truck rumbled from the street into the garage*, 'to move from X to Y by rumbling'.

This account is further complicated by the fact that the decision whether a given sentence denotes an event that can be viewed as proceeding in an incremental way may also depend on the cognitive schemas associated with particular form-meaning linguistic pairings, as can be illustrated with *John saw twenty-five elephants* and *The doctor examined the patient*. Such sentences can be construed as describing events that involve some established procedure (consisting of a number of successive steps, for example) that delimits them. Only under the 'incremental' construal are the above sentences telic, otherwise, they are atelic.

In short, individual verbs cannot often be classified once and for all as denoting homomorphism. (Notice that we seem to be here faced with a similar problem as Vendler's attempts to classify surface verbs as activities and accomplishments; cf. Dowty's (1979:60ff.) criticism of Vendler.) I propose to maintain the notion 'Incremental Theme' for the semantic argument that denotes the 'object' with respect to which a given verb entails a homomorphism, as in Krifka and Dowty's theory, while, at the same time, to allow for the possibility that a homomorphism may have other sources than just the lexical semantics of individual verbs, sources whose domain may be the meaning of a whole sentence. I propose that a homomorphism between algebraically structured Theme NP and event denotata characterizes a fragment of conceptual structure, an *Incremental Schema*. And it is against this schema that certain Aktionsart and aspect properties of sentences are interpreted. The status of the Incremental Schema in the conceptual representation of sentences is comparable to that of a *scalar model* with respect to which, for example, a *let alone* sentence is interpreted (cf. Fillmore, Kay, O'Connor 1988). This view requires that we define the relationship between the meaning of the verb and the meaning of sentential constructions.

Second, rather than assuming that thematic roles are functions, we may understand them as relations between individuals and events. At the same time, instead of a procedural approach implicit in Krifka and Dowty's analysis, which is evident in such notions as 'the transfer of reference mode' (Krifka 1986; 1989) and 'Theme-to-event' homomorphism (Dowty 1991:567), I propose a declarative description within a unification-based approach (cf. Shieber 1986; Pollard & Sag 1993; Fillmore & Kay 1992). Within this approach, a verbal predicate and an Incremental Theme NP each specify partial information about a single linguistic object, a sentence. They introduce instances of the same parameters: *bounded* and *cumulative*. These parameters encode information coming from three sources: Aktionsart, characterized in terms of the 'quantized/cumulative' distinction, aspect, characterized in terms of the 'bounded/unbounded' distinction, and Incremental Theme NP which is characterized in terms of both these distinctions, as it interacts, at the same time, with both Aktionsart and aspect. Constraints imposed by language require that information coming from these three sources be compatible. Such a unification-based account has the following advantages: it allows us (i) to distinguish between the interaction of nominal and verbal predicates on the level of aspect and on the level of Aktionsart as well as to define the relation between the two; (ii) to provide an intuitively more plausible account of the data from such Slavic languages as Czech; (iii) to compare the different morphological and syntactic strategies for encoding aspect in typologically distinct languages in terms of a difference in the grammaticalization of the 'bounded/unbounded' distinction (cf. the comparison of the interaction between the nominal and verbal predicates in Czech and Finnish in Filip 1992).

The distinctions 'quantized/cumulative' and 'bounded/unbounded' belong to a finite set of primitives that characterizes parts of conceptual structure. Just like the 'quantized/cumulative' distinction, the 'bounded/unbounded' distinction is orthogonal to the distinction between individuals and events. The application of the distinction 'bounded/unbounded' in the domain of events and objects is determined by the different topological properties of their respective cognitive schematizations. Following Jackendoff (1990), I assume that the condition "on dimensionality of boundaries is that the *schematization* of a boundary has one dimension fewer than the *schematization* of what it bounds" (Jackendoff 1990:24). While the progression of states of affairs through time can be schematized as a time line, objects can be schematized as two- or three-dimensional entities, as regions or volumes. If we apply the distinction 'bounded/unbounded' to states of affairs, the boundary will be schematized as a single point on a time-line. In the domain of objects, a region will be bound by a line, and a volume by a surface. Saying that a given NP is 'bounded', in addition to saying that it is 'quantized', means that we view the entity denoted by it in its entirety, that is, in this sense, we "focus" on its boundaries. Therefore, a 'bounded' NP must be 'quantized', as well. However, a 'quantized' NP need not be 'bounded'. While 'unbounded' simply means that we abstract away from the boundaries of the entity and instead consider some of its subparts.

The homomorphism between algebraically structured Incremental Theme NP and event denotata yields, to put it quite simply, the following correlations: 'bounded event - bounded object' and 'unbounded event - unbounded object'. This correctly predicts that only the DO-NPs in such pairs of Czech sentences as (2) and (3) will have different interpretations with respect to the 'bounded/unbounded' distinction, while the DO-NPs in (5) will not.

In those cases in which a perfective verb co-occurs with a determinerless Incremental Theme NP that is headed by a mass or plural noun, this may be implemented in the following way: It is assumed that NPs may have different feature specifications for the

head noun and the whole phrase. The head nouns will be specified with the feature attribute 'cumulative', while the whole NP in terms of the feature attributes 'cumulative' and 'bounded'. A mass or plural noun head will be specified with the feature specification '[cumulative +]' that reflects its inherent lexical properties. If the whole NP functions as an Incremental Theme NP of a perfective verb, it "acquires" a '[bounded +]' status from it via unification. In imperfective constructions, the Incremental Theme NP construction "acquires" via unification the '[bounded -]' status from the imperfective verb.

Aktionsart properties of sentences are determined by the feature attribute 'cumulative': it characterizes the inherent lexical semantic properties of the head noun of an NP and it is inherited by the whole NP construction provided that it is sanctioned by the feature co-occurrence restriction that captures the interaction between Aktionsart and aspectually relevant semantic features: '[bounded +] → [cumulative -]'. Notice that this restriction is motivated by general cognitive principles mentioned above: An entity that is viewed in its entirety, with respect to its boundaries, must be quantized, as well. The value assigned to the 'cumulative' feature attribute of the whole NP construction unifies with the values assigned to the 'cumulative' feature attribute of the head verb, which in turn unifies with the value of the attribute 'cumulative' of the whole sentence. This yields the right results, namely that perfective sentences with cumulative Incremental Theme NPs are bounded (perfective) and quantized (telic), while imperfective sentences with cumulative Incremental Theme NPs are unbounded (imperfective) and cumulative (atelic). Imperfective sentences with quantized Incremental Theme NPs are quantized (telic) and unbounded (imperfective).

Sentences headed by such verbs as *to stir* denote events that do not evolve in lock-step with the changes that one of their participants undergoes (at least under the most usual reading). So it is not possible to correlate a part of the time interval during which a part of the event took place with the appropriate subpart of the participant at which the event is directed in the same way in which the part of a pullover, for example, can be correlated with the time interval during which knitting of that part of a pullover took place. In short, since *to stir* is not homomorphic, the DO-NPs in (5a) and (5b) do not differ with respect to their boundedness properties.

4. The generalization (11) is related to a number of issues connecting referential specificity, explicit quantificational operators of various kinds and topicalization.

I propose that the difference in referential specificity that the Incremental Theme DO-NPs manifest in such sentences as (2a) - (2b) and (3a) - (3b) follows as a pragmatically determined by-product of a bounded and an unbounded interpretation assigned to them in perfective and imperfective sentences, respectively. Unless the lexical semantics of a perfectivizing V^0-modifier specifies otherwise, the bounded interpretation of Incremental Theme NPs in perfective sentences takes on a holistic interpretation. For example, (2b) describes an event that ended when the Agent finished drinking all the available coffee. In general, an entailment that a given object or a set of objects was completely subjected to an event presupposes that it is bounded. If a NP is cumulative, the only way in which the boundaries of its referent can be fixed, is to anchor it to an entity or a set of entities easily identifiable in the discourse context.[7] This may explain why the speaker who utters perfective sentences (2b) or (3b), for example, presupposes that the hearer can uniquely identify the entity that is spoken of: a *specific* or *known* portion of coffee or a set of pullovers.

On the other hand, the existence of a subpart of an entity does not presuppose the existence of a whole bounded entity, rather it merely allows for the possible existence of a (contextually) relevant additional quantity or continuation. An 'unbounded' NP may be cumulative or quantized. Therefore, if an Incremental Theme NP that is cumulative occurs in imperfective sentences, such as (2a) and (3a), we need not identify its boundaries, we need not anchor its referents to any particular portion of stuff or set of entities in the domain of discourse. Moreover, since inferences to specific bounded subparts in such sentences are in general not valid, because they would provide more information than is linguistically specified, cumulative Incremental Theme NPs tend to have not only 'unbounded' or partitive interpretation, but also a referentially *unspecified* interpretation.

The correlation between bounded interpretation and referential specificity, on the one hand, and unbounded interpretation and unspecified object interpretation, on the other hand, does not apply in the following three cases: if (i) the Incremental Theme NP functions as subject (in particular, in the sentence initial position), (ii) it is quantized (that is, if it is singular count or if it contains a determiner quantifier or a measure expression), or (iii) a sentence contains A-quantifiers, including those incorporated in V^0-modifiers. Subjects often function as topics. And topicalized constituents that occur in a sentence-initial position are often highly individuated and definite, regardless of the verb aspect. If Incremental Theme NPs are quantized, they may have a referentially specific or unspecified interpretation, again independently of the verb aspect. The reason is that the bounded and unbounded interpretation is assigned to them with respect to the prototopical extent of their denotata or with respect to the quantity indicated by the quantifying or measure expression. In particular, in perfective sentences the assignment of a bounded reading to an inherently quantized Incremental Theme NP is not contingent on its contextual anchoring to a specific entity in the domain of discourse, and therefore such an Incremental Theme NP need not have a referentially specific interpretation. In general, NPs that contain determiner quantifiers or measure expressions are considered to have a different discourse function from that of referring NPs. While a proposition with a referring NP picks out a specific object in the domain of discourse, a proposition that contains a quantified or a measured NP describes an object. Measure expressions are low in individuation. Typically, we do not talk about a specific yard, a pint of beer, a cup of coffee ("the yard", "the pint of beer", "the cup of coffee"), we count such entities, but we do not take an interest in them individually as discrete particular participants in an event.

Some V^0-modifiers impose very specific restrictions on the interpretation of their Incremental Themes that have to do with quantity, measure or quantification. In perfective sentences this means that Incremental Theme NPs are not only bounded, but also they are restricted by such idiosyncratic lexical semantic properties of a given V^0-modifier. For example, the prefix *na-* contributes the notion of gradual amassing or accumulation to the meaning of the verb it modifies. Its impact on the Incremental Theme NP is roughly comparable to the unstressed 'some' in English or to an indefinite measure expression. This can be shown by the fact that Incremental Theme NPs of *na*-verbs can be only modified with measure expressions and determiner quantifiers that do not require that the noun in their scope refer to a quantity consisting of a number of discrete and countable entities. This is illustrated by (14):

(14)

Nakoupil[P]	hodně / koš	/ *?pět	jablek.
PREF-bought-3SG	a-lot-of / basket-ACC	/ *?five	apples-PL-GEN

'He bought a lot of / a basket of / five apples.'

Such examples show that Incremental Theme NPs that function as arguments of *na*-verbs are treated as constituting an undifferentiated whole, and not as composed of separate individuals. This notion of amassing, accumulation, or a vague measure is clearly related to the fact that Incremental Themes that function as arguments of *na*-verbs are also *referentially unspecified* and low on an individuation scale. For example, if a question such as 'Where did you buy these postcards?' introduces 'postcards' into the domain of discourse, we cannot answer with the verb *nakoupit*^{P} 'to buy', because it requires a referentially unspecified object. Instead, the appropriate answer should contain the perfective verb *koupit*^{P} 'to buy' that can be combined with a referentially specific DO:

(15)

> *Nakoupil^P / Koupil^P jsem je v kiosku.
> *PREF-bought-1sg / bought-1sg AUX them-PL-ACC in kiosk
> 'I bought them in the kiosk.'

Other perfective *na*-verbs are, for instance: *natrhat*^{P} 'to pick', *nabrat*^{P} *vodu* 'to draw (in) some water', *nachytat*^{P} *ryby* 'to catch some fish', *nasbírat*^{P} *jahody* 'to pick some strawberries', *nasporit*^{P} *peníze* 'to save some money'.

5. One of the arguments in support of my claim that it is the Incremental Theme NP that is accessible to the semantic effects of V^0-modifiers has to do with the fact that Incremental Theme NPs that contain determiner quantifiers and other quantifying and measure expressions interact in specific ways with imperfective verbs. On the other hand, there no restrictions on the occurrence and interpretation of such expressions in sentences headed by imperfective verbs that do not entail a homomorphism. To illustrate this point, consider first the following examples:

(16-a)

> Pil^I (*)všechnu kávu.
> drank-3SG-MASC (*)all-ACC coffee-ACC

(16-b)

> Pil^I (*)dvě kávy / (*)hodně kávy.
> drank-3SG-MASC (*)two coffee-GEN / (*)a-lot-of coffee-GEN

In imperfective sentences denoting simple events, such as (16a) and (16b), Incremental Themes cannot be quantified with the universal quantifiers 'all' and 'whole' and count cardinal numerals and they usually do not occur with most other quantifiers and with various measure expressions. "(*)" in (16a) - (16b) indicates that a clash between an imperfective aspectual V^0-modifier and a quantified Incremental Theme NP in its scope can be resolved if an iterative or a habitual interpretation can be assigned to the whole predication. (16b), for example, would be acceptable in the context of a frequency adverbial phrase: 'Every day, he drank two coffees, a lot of coffee.' In this case, the iterative operator takes scope over both the aspectual V^0-modifier and the quantified Incremental Theme.

In imperfective sentences that contain a quantified Incremental Theme NP we may enforce a simultaneous event reading by using the temporal adverbial *najednou* 'at the same time', as in (17):

(17)

> Pletla^I deset svetrů najednou.
> knitted-3SG-FEM ten pullovers-PL-ACC at-the-same-time
> 'She was knitting ten pullovers at the same time.'

(17) entails that each of the ten pullovers was gradually coming into existence. Following Link (1983), I assume that plural NPs represent sum individuals, that is, they represent individuals that consist of other individuals. Since the plural predicate in (17b) is interpreted as distributive, (17b) entails that each member of the sum individual 'ten pullovers' was partially subjected to the knitting event.

We may conclude that imperfective sentences that contain Incremental Themes that occur in a construction with a determiner quantifier tend to lose the ability to denote simple single events. They denote (i) iterative, habitual events, or (ii) a complex event consisting of a number of subevents of the same type. If the context excludes these two interpretations, the use of a quantified Incremental Theme NP is often ungrammatical or, at least, odd. So (16b), for example, would be odd in the following context: 'Last night, he drank two coffees, a lot of coffee.' In such a context, quantified Incremental Themes strongly favor the environment of perfective aspect: *Včera večer vypil*^{P} *dvě kávy* 'Last night, he drank (up) / he had two coffees.'

Since such verbs as *to see* do not entail a homomorphism between algebraically structured Incremental Theme NP and event denotata, there is no clash between an imperfective aspectual V^0-modifier and a quantified or measure NP in its scope. In this case, the whole imperfective sentence does not lose the ability to denote simple single events. This is shown by (18):

(18-a)

> Děti viděly^I všechny chřestýše.
> children-PL-NOM saw-3PL-NEU all rattle-snakes-PL-GEN
> 'The children saw all the rattle-snakes.'

(18-b)

> Děti viděly^I hodně / deset chřestýšů.
> children-PL-NOM saw-3PL-NEU a-lot-of / ten rattle-snakes-PL-GEN
> 'The children saw a lot of / ten rattle-snakes.'

The seemingly complicated way in which quantified NPs interact with aspect puzzled linguists working on Slavic languages (cf. Wierzbicka 1967; Rassudova 1977; Merrill 1985; among others). Slavic linguistics has so far failed to provide an adequate description for this interaction. In this section, I have suggested that we can easily describe it, if we recognize that the Incremental Theme provides the missing semantic link in this puzzle. The restrictions on the occurrence of determiner quantifiers and other quantifying and measure expressions that modify Incremental Themes can be explained if we assume that V^0-modifiers have semantic effects on Incremental Theme NPs that must be compatible with the quantifying and measure expressions that modify Incremental Theme NPs.

6. In their aspect and Aktionsart coding function, V^0-modifiers are propositional operators. And clearly related to this role are their semantic effects on the interpretation of nominal arguments. Since the verb and its arguments are in the relation of predication, and since the predication is necessarily a local relationship, V^0-modifiers have 'local semantic effects', and in some cases 'local quantificational effects' (cf. Partee 1990:10) on nominal arguments. These 'local effects' are directed to a specific argument of the verb. In this respect V^0-modifiers differ from the paradigm cases of A-quantification, namely those expressed by sentential adverbs, such as *always* ("adverbs of quantification") that can unselectively bind any number of free variables in their scope

(cf. Lewis 1975 and Heim 1982).

Bach (in Bach, Partee & Kratzer 1987:22) suggests for Haisla that only the obligatory arguments of the main verb are accessible to quantificational auxiliaries. Brodie and Dowty (1984:78) propose that VP quantifiers "float" from obligatory arguments, from subjects, direct objects and indirect objects, but not from optional oblique NPs.

In Czech, and other Slavic languages, V^O-modifiers may extend their semantic effects not only over DO-NPs, but also over subject-NPs and PPs, both obligatory and optional. I suggest that V^O-modifiers extend their semantic effects over the Incremental Theme argument of the verb they modify. Such a semantically based account has the advantage that it allows us to predict which syntactic argument will be accessible to a given V^O-modifier in Czech (and other Slavic languages). This analysis also has the advantage that all the parameters on which it is based and that give rise to the different referential and quantificational interpretations of nominal arguments are independently motivated and are needed elsewhere in the grammar.

In this paper, I have only examined Czech. However, the phenomena described are not restricted to this language. They can be clearly observed in other Slavic languages, but also in such typologically distinct languages as Hindi and Japanese, for example, that do not have articles and that express the aspectual distinction 'perfective vs. imperfective' in a systematic way by means of verbal expressions.

The choice between D-quantification and A-quantification is not imposed on languages by the real world, but rather it is a matter of language-specific schematizations, and of cognitive choices inherent in such schematizations. Viewed from an even broader theoretical perspective, the investigation of the structure and interpretation of D-quantification and A-quantification can give us an indirect access to the semantic differences underlying the 'verb-noun' distinction and its relation to the ontology of individuals and events, as Partee, Bach and Kratzer (1987) suggest. The study of non-NP quantification by means of various A-quantifiers is important as "a counterbalance to the nearly exclusive concentration on NP quantification in most of the previous syntactic and semantic literature" (Partee 1990:8).

Footnotes

* I am grateful to Charles Fillmore, Mirjam Fried, Paul Kay, Manfred Krifka, Alan Timberlake, and Stephen Wechsler for valuable discussions and comments.

1. For a discussion on the fuzziness of the inflection-derivation distinction and the Slavic aspectual distinction, see Spencer (1991:195ff.).

2. It is surprising how little attention has been paid to understanding the impact of verb morphology on the interpretation of nominal arguments in Slavic linguistics. Standard grammar handbooks that describe particular Slavic languages characterize many lexical-derivational operators that are applied to verbs in terms that are related to quantity, measure and quantification. This is in particular true for the description of prefixal semantics, as in *Mluvnice Češtiny, Vol. I* ('Grammar of Czech Vol. I', pp. 387ff.) and in Isačenko's work (1960 and 1962:385-418). Various studies on Slavic linguistics contain occasional hints at the interaction between verbal and nominal predicates and there are a few studies that deal with some of its aspects, for instance, in Polish (Wierzbicka 1967) and in Russian (Forsyth 1970; Merrill 1985; and Russell 1985). However, a systematic analysis is so far missing. The main reason for this gap in the coverage of data can be

seen in the concentration of Slavic linguistics on the form-meaning correspondences on the level of verb morphology or on the description of aspect and Aktionsart in the discourse.

3. *Na*-verbs of this 'accumulation' type that are reflexive take a genitive DO. The issues related to the use of the genitive and accusative DO do not have any impact on the discussion in this paper and so will not be addressed here.

4. In (7), we could also use the mass noun in the genitive case: *kávy* (lit.: coffee-GEN). The case difference does not have any effect on the overall meaning of the sentence.

5. Šmilauer (1968;71:165), for example, gives the following list: *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-.*

6. Cf. Dowty (1991:552): "the most general notion of thematic role (type) is A SET OF ENTAILMENTS OF A GROUP OF PREDICATES WITH RESPECT TO ONE OF THE ARGUMENTS OF EACH".

7. The determination of the boundaries marking the extent of referents of determinerless mass and plural NPs can be also facilitated by the frames (in Fillmorean sense) evoked by the linguistic material in a given sentence. For example, in (2b), the frame evoked by the verb *vypít* 'to drink (up)' and the NP 'coffee' involve information about the containers (cups, mugs, pots, etc.) in which coffee is usually served that have a certain standard or conventional size. Since (2b) is headed by a homomorphic verb, the referent of the Incremental Theme DO, 'coffee', undergoes a gradual change, whereby its successive stages can be identified on the basis of the 'part-of' relationship it bears to the upper bound of the understood container, and the part structure of the whole event is mapped into the amount of coffee that fills exactly *one* such understood container. (2b) entails that an event is completed, when the container is empty. The notion *frame* is here used in the sense introduced by Fillmore:

8. The following example also confirms my claim that *na*-verbs only take referentially non-specific arguments:

Děti	natrhaly[P]	jablka	(?ze stromu).
children-PL-NOM	PREF-picked-3PL	apples-ACC	(?from tree)

'The children picked some apples (from the tree).'

The only acceptable interpretation assigned to this sentence would require that the PP *ze stromu* 'from the tree' refers to a specific tree. This, however, would also require that 'apples' would have to be referentially specific. This explains why the use of the PP in this sentence is odd. Notice that the following sentence is also ungrammatical:

Napil[P]	se	?*zbytku	kávy.
REF-drank-3SG	REFL	?*rest	coffee-GEN

'He drank some of the remaining coffee.'

'The rest of X' presupposes that 'X' is known, that it is both quantificationally and referentially specified, therefore it clashes with *napít se[P]*.

References

Brodie, Belinda and David Dowty. 1984. 'The Semantics of "Floated" Quantifiers in a Transformationless Grammar.' In: Cobler, M., MacKaye, S. and M. T. Wescoat (Eds.) *Proceedings of the West Coast Conference on Formal Linguistics*. Volume Three. The Stanford Linguistics Association. Stanford.

Dahl, O. 1985. *Tense and Aspect Systems*. London - New York: Basil Blackwell.

Dalrymple, M., Mchombo S. and S. Peters. 1992. "Semantic similarities and syntactic contrasts between Chicheŵa and English reciprocals", ms.

Dowty, D. R. 1972. *Studies in the Logic of Verb Aspect and Time Reference in English*. Doctoral Dissertation, University of Texas at Austin.

Dowty, D. R. 1977. "Toward a semantic analysis of verb aspect and the English 'Imperfective' progressive." In: *Linguistics and Philosophy*, 1, pp. 45-79.

Dowty, D. R. 1979. *Word Meaning and Montague Grammar. The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Dordrecht: Reidel.

Dowty, D. R. 1988. "Thematic Proto-Roles, Subject Selection, and Lexical Semantic Defaults", ms. (Paper presented at the 1987 LSA Colloquium. The Twenty-Second Annual Meeting of the Linguistic Society of America, San Francisco; preliminary draft of January 1988).

Dowty, D. R. 1991. "Thematic Proto-Roles and Argument Selection". In: *Language*, 67, 3, 547-619.

Davidson, D. 1967. "The Logical Form of Action Sentences". In: N. Rescher (Ed.). *The Logic of Decision and Action*. Pittsburgh: University of Pittsburgh Press. pp. 81-95.

Filip, H. 1992. "Aspect and the Semantics of Quantity of Verbal and Nominal Expressions". *Proceedings of the East Coast Conference in Linguistics*. Ithaca: DMLL Publications, Cornell University.

Fillmore, Ch. J. 1985. "Frames and the Semantics of Understanding." *Quaderni di Semantica*. Vol. VI, No. 2, December, pp. 222-254.

Fillmore, Ch. J. and P. Kay. 1992. *On Grammatical Constructions*. Department of Linguistics, The University of California at Berkeley. ms.

Flier, M. S. and R. D. Brecht. (Eds.). 1985. *Issues in Russian morphosyntax*. Columbus, Ohio: Slavica Publishers, 1985. Series title: UCLA Slavic studies ; v. 10.

Flier, M. S. and A. Timberlake. 1985. *The Scope of Slavic aspect*. Columbus, Ohio : Slavica Publishers.

Garey, H. B. 1957. "Verbal Aspects in French". In: *Language* 33, pp. 91-110.

Heim, I. R. 1982. *The Semantics of Definite and Indefinite Noun Phrases*. Ph. D. dissertation, University of Massachusetts at Amherst.

Hinrichs, E. 1985. *A Compositional Semantics for Aktionsarten and NP Reference in English*. Ph.D. Thesis, Ohio State University.

Hoepelman, J. Ph. 1981. *Verb Classification and the Russian Verbal Aspect: A Formal Analysis*. Tübingen: Gunter Narr Verlag.

Isačenko, A. V. 1960. *Grammatičeskij stroj russkogo jazyka v sopostavlenii s slovackim. Morfologija*, pt. 2. Bratislava.

Isačenko, A. V. 1962. *Die russische Sprache der Gegenwart*, Part I, *Formenlehre*. Halle (Saale): Niemeyer.

Jackendoff, R. S. 1990. "Parts and Boundaries". ms.

Krifka, M. 1986. *Nominalreferenz und Zeitkonstitution. Zur Semantik von Massentermen, Individualtermen, Aspektklassen*. Doctoral Thesis, The University of Munich, Germany.

Krifka, M. 1987. *Nominal Reference and Temporal Constitution: Towards a Semantics of Quantity*. (FNS-Bericht 17.) Tübingen: Forschungsstelle für natürliche Systeme, Universität Tübingen.

Krifka, M. 1989. *Nominalreferenz und Zeitkonstitution. Zur Semantik von Massentermen, Individualtermen, Aspektklassen*. Wilhelm Fink Verlag München.

Krifka, M. 1992. "Thematic Relations as Links between Nominal Reference and Temporal Constitution." In: Sag, I. A. and A. Szabolsci (Eds.), *Lexical Matters*, pp. 29-53.

Kopečný, F. 1962. *Slovesný vid v češtině*. Praha: Nakladatelství Československé akademie věd, Series title: Československá akademie věd.

Kučera, H. 1983. "A Semantic Model of Verbal Aspect." In: *American Contributions to the Ninth International Congress of Slavists. Kiev, September 1983. Volume I: Linguistics*, Ed. Michael S. Flier. Columbus, Ohio, pp. 171-184.

Lewis, D. 1975. "Adverbs of Quantification." In: E. L. Keenan (Ed.). *Formal Semantics of Natural Language*. Cambridge: Cambridge University Press.

Link, G. 1983. "The Logical Analysis of Plurals and Mass Terms". In: Bäuerle, R., Ch. Schwarze and A. von Stechow (Ed.). *Meaning, Use, and Interpretation of Language*. pp. 302-323.

Merrill, P. 1985. "Universal quantification and aspect." In: Flier, M. S. and R. D. Brecht (Eds.) *Issues in Russian Morphosyntax*. UCLA Slavic Studies. Vol. 10. Slavica Publishers, Inc.: Columbus Ohio. pp. 58-72.

Partee, B. H. 1990. "Domains of Quantification and Semantic Typology." In: Ingeman, F. (Ed.) *Proceedings of the 1990 Mid-America Linguistics Conference*, University of Kansas.

Partee, B. H. 1991. "Adverbial Quantification and Event Structures". In: *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistic Society*. Berkeley.

Partee, B., E. Bach, and A. Kratzer (1987) "Quantification: A Cross-Linguistic Investigation". NSF proposal, University of Massachusetts at Amherst (ms.).

Petr, Jan. 1986. *Mluvnice Češtiny. Part I: Fonetika, Fonologie, Morfonologie a morfemika, Tvoření slov*. Praha: Academia.

Pollard, C. and I. A. Sag. 1993. *Head-Drive Phrase Structure Grammar*. Chicago: Chicago University Press and Stanford: CSLI Publications.

Rassudova, O. P. 1977. "Aspectual Meaning and Aspectual Context in the Teaching of Russian Verbal Aspect". In: Brecht, R. D. and D. E. Davidson (Eds.) *Soviet-American Russian Language Contributions*. Urbana, Ill.: G & G Press. pp. 139-144.

Russell, P. 1985. "Aspectual Properties of the Russian Verbal Prefix *na-*". In: Flier, M. S. and A. Timberlake (Eds.). *The Scope of Slavic aspect*. Columbus, Ohio : Slavica

Publishers, pp. 59-75.

Shieber, S. M. 1986. *An Introduction to Unification-Based Approaches to Grammar.* Center for the Study of Language and Information. Stanford.

Spencer, Andrew. 1991. *Morphological Theory. An Introduction to Word Structure in Generative Grammar.* Oxford, Cambridge (Mass.): Basil Blackwell.

Vendler, Z. 1957. "Verbs and Times". In: *Philosophical Review*, 56, pp. 143-160.

Verkuyl, H. J. 1972. *On the Compositional Nature of the Aspects.* Foundations of Language, Supplementary Series, Vol. 15. D. Reidel Publishing Co., Dordrecht, Holland.

Wierzbicka, A. 1967. "On the Semantics of Verbal Aspect in Polish." In: *To Honor Roman Jakobson.* Volume 3. Mouton. The Hague: Paris. pp. 2231-49.
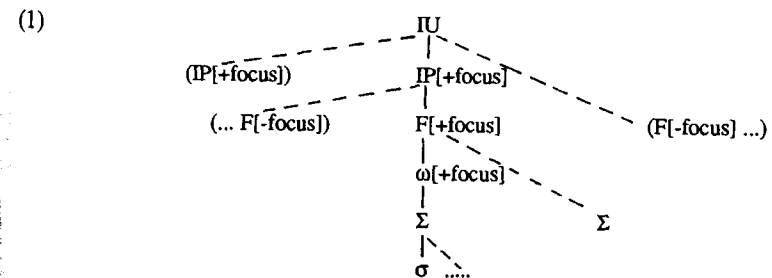
The Norwegian 'Boundary Tone Agreement' Condition

Thorstein Fretheim
University of Trondheim

1. Norwegian pragmatic particles and parentheticals appearing in an extraclausal ('tag') position have some prosodic properties which they do not share with any other sentence elements. I am going to demonstrate that 1) they cannot bear pitch-accent, which means that they are not realized with Accent 1 (L* in (East) Norwegian) or Accent 2 (H*+L in (East) Norwegian), 2) they invariably participate in the expression of one of the two boundary tones L% or H% (cf. the notation used by Pierrehumbert 1980, Pierrehumbert and Hirschberg 1990), 3) they are lexically marked as permitting either L% or H%, or both (subject to certain constraints on the syntactic form and the intonational phrasing of the preceding clausal host), and 4) when there is more than one of them in a row, they must be either all L%, or all H%. The fourth and final requirement is what I will here refer to as the BOUNDARY TONE AGREEMENT CONDITION, or the BTAC.

My primary aim is to demonstrate the interplay of ICONIC and NON-ICONIC features of intonation contours. The way that the BTAC will be shown to apply to extraclausal tag items in spoken East Norwegian is a striking illustration of that type of interaction.

2. Norwegian pitch variations are largely a function of the intonational phrasing superimposed on an utterance. I assume an intonational constituent structure hierarchically organized as shown in (1), where broken branches and parenthesized nodes represent optional expansions of the I(ntonational) U(tterance) and solid branches obligatory expansions. The prosodic hierarchies proposed by Selkirk (1984) and by Nespor and Vogel (1986) differ from my IU structure in that they are not primarily motivated by intonational form and function.

(1)

The I(ntonational) P(hrase) in (1) is marked as a focused constituent. The bivalent feature specification [+focus] attached to IPs is inherited by the head of IP, its final F(oot), and further by the accented prosodic word heading the IP-final F.

[+focus] is mapped onto s-structural syntactic representations. For each [+focus]-marked accented prosodic word in intonational phonology there is a syntactic terminal symbol serving as focus exponent. [+focus] is projected from focus exponents to syntactic nodes at a level corresponding to the prosodic IP (cf. Fretheim 1990, 1991a).