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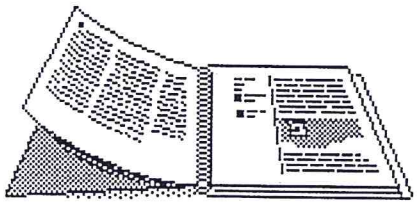

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# Papers on Predicative Constructions

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# Papers on Predicative Constructions

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# Preface

This volume presents a collection of papers touching on various issues concerning the syntax and semantics of predicative constructions.

A hot topic in the study of predicative copula constructions, with direct implications for the treatment of *be* (how many *be*'s do we need?), and wider implications for the theories of predication, event-based semantics and aspect, is the nature and source of the situation argument. Closer examination of copula-less predications is becoming increasingly relevant to all these issues, as is clearly illustrated by the present collection. Five main classes of *copula-less predication* figure in the research reported here:

(i) primary predications lacking an overt copula, such as occur in Russian or Chinese (cf. *Tang*'s paper), and also child English (cf. *Becker*'s paper)
(ii) depictives (e.g. *she met him drunk*)
(ii) resultatives (e.g. *she shot him dead*)
(iii) complement small clauses (governed by e.g. epistemic, causative or perception verbs),
(v) predication internal to complex VPs of the dative shift or *spray/load* types (cf. *Brandt*'s paper)

A related hot topic is the *stage level / individual level distinction*. The linguistic importance of the SL/IL distinction is due to the role identified for it (a) as a defining factor in various constructions – e.g. in 'epistemic' small clauses like *consider*+NP+Pred, Pred is IL only, while in resultatives and depictives (V+NP+Pred) and *there+be*+NP+Pred constructions, it is SL only; (b) in determining morphological form of the predicate – e.g. the variation between the Instrumental Case and 'Agreeing Case' forms of Russian secondary adjectival predicates; and (c) in accounting for restrictions on the interpretation of the subject of the predication ('subject specificity' effects, cf. Diesing's Mapping Hypothesis).

- Three contributions (*Bailyn, Demjjanow & Strigin*, and *Hinterhölzl*) are directly concerned with the syntactic and semantic factors governing the Case alternation in adjectival predicates in Russian.

Two papers deal with other issues concerning the ILP/SLP distinction:

- *Becker* discusses evidence that the ILP/SLP distinction plays a role in patterns of copula omission in child English.

- *Percus* reflects on semantic and pragmatic constraints on temporal adverbial modification, an issue crucial in determining the nature of the ILP/SLP distinction.

Three of the papers deal with different aspects of predication and specificity in Chinese:

- *Zhang* presents an analysis of the syntactic properties of, and differences between two main types of secondary predication (depictive and resultative constructions) in Chinese.

- *Tang* investigates copula-less primary predications in Chinese and pragmatic principles that govern their distribution

- *Tsai* explores a Mapping Hypothesis approach to the distribution of specificity effects in object position in Chinese clauses.

The remaining two papers are concerned with the nature and role of events and 'internal predication' in complex verb phrases.

- *Rothstein* examines the concept 'incremental theme' from the point of view of the semantic structure of accomplishment predicates, both lexical (*build a house*) and derived (i.e. resultatives such as *sing the baby asleep*).

- *Brandt* explores syntactic and semantic links between simple predications (especially *there*-constructions) and complex verb-phrase types involving 'argument shift' (especially 'dative shift' and *spray/load* verbs).

All of the papers except those by *Demjjanow & Strigin* and *Zhang* are based on presentations at the workshop 'Predicative Constructions' held in ZAS in October 2000.

The uncommon amount of ink devoted here to Russian and Chinese reflects the fact that these two languages figure prominently in the editors' current research.

*The editors*

# The Syntax of Slavic Predicate Case

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In this article I provide a syntactic framework for case patterns found in Slavic secondary predicates, such as those shown in (1).

1) a. Ja našel ego p'janym RUSSIAN
$I_i$-Nom found $him_k$-**Acc** $drunk_k$-**Instr**
"I found him drunk."

b. ?Ja našel ego p'janogo
$I_i$-Nom found **$him_k$**-Acc $drunk_k$-**Acc**
"I found him drunk."

Descriptively, the paradigm can be characterized as the alternation between the predicate instrumental (1a) and what I will call "Sameness of case" (1b), but which is commonly known as "agreeing case". "Sameness" or "agreeing case" means the appearance on the predicate of the same case that marks an argument in the sentence, such as the Accusative on *drunk* in (1b) mathcing the Accusative of the direct object *him*. The purpose of this article is to show that this variation reduces to the festure makeup of a functional category. In this sense I am supporting a claim made by Rothstein (1992), namely that predication is at its core a syntactic relation, and that thematic and interpretative aspects of it are in a sense secondary, not defining (which is certainly not to say that they do not exist).

Clearly, this view is not shared by all linguists working on predication -- indeed Hinterhoelzl (2000) starts with quite a quite different claim, which I will call the "semantic approach to predicate case choice", given in (2):

2) The semantic approach to predicate case choice (Hinterhoelzl 2000, emphasis mine):

> *The factors that determine which of the two [predicate case] forms, the agreeing or the invariant form, is appropriate in a given sentence are all semantic in nature.*

A similar view is put forth in Kennedy & Filip (this volume). I will present a particular approach to the syntax of case on predicates which, if it is at all on the right track, will throw the statement in (2) into doubt, at least in its strongest form. Instead, I would like to put forth a different kind of claim, on that could be named "the syntactic approach to predicate case", as given in (3):

3) The syntactic approach to predicate case (this article):

> *a. The factors that determine which of the two predicate case forms, the agreeing or the invariant form, is possible in a given sentence are all syntactic in nature.*

*b. Semantic distinctions are relevant only in those cases where the syntax allows both forms.*

(3b) indicates that the two views are not necessarily incompatible, but that (3a) provides possible configurations for the two case patterns, and only in cases where both are syntactically available, does (2) kick in, as stated in (3b). Essentially, I show that there is no more **direct** connection between the interpretation and the morphology of predicates than there is between the interpretation and morphology of arguments.

The article is structured as follows. In Section 1, I present the Structural Case Hypothesis for predicates, showing that given a few simple assumptions, predicate case should turn out to be a simple analog of argument case, a desired result in an economical theory of language. In section 2, I present the Slavic data, pointing out along the way cases that appear intractable for semantic approaches such as (2). In section 3, I provide the particular syntactic framework I am assuming, independently motivated for predication in non-Slavic languages. In section 4, I show how this framework provides an elegant account of the two kinds of Slavic predicate case. Further, I show that only this syntax of predicate case allows a close parallel between argument case and predicate case. In section 5, I address some important additional questions the account raises. In section 6, I conclude with discussion of the compatibility between semantic and syntactic accounts.

## 1 The Structural Case Hypothesis for Predicates

In supporting (3), I will argue for a form of Maling & Sprouse's (1995) Structural Case Hypothesis for predicates, presented in (4).

4) The Structural Case Hypothesis for Predicates (Maling & Sprouse 1995)[1]

a. *Predicate NPs always receive case structurally*

b. *Predicate NPs are assigned structural case in the same way as argument NPs*

c. *Case "agreement" is epiphenomenal*

4) d. *Predicate NPs get case via the same mechanism as verbal arguments (this article)*

Any theory that requires independent case mechanisms, such as "case by agreement" for handling predicate NPs, in addition to those needed for argument case, is less economical, and should be dispreferred, all else being equal. Such a theory moves morphology and syntax closer together; this possibility serves as the theoretical core of this article. (4d) differs from the 3 specific proposals of Maling & Sprouse (1995) only in adding the possibility of a kind of Lexical Case for predicates. By showing how predicate NPs get case via the same mechanisms as argument case, we eliminate the necessity for distinct case "strategies" for predicates. With respect to predicates, this obviates the need for thinking of them as "caseless", or not subject to "visibility" in the Government and Binding sense. (Chomsky and Lasnik (1991), den Dikken & Næss (1993)).[2] Rather, it allows us to maintain the strong versions of the early GB Case Filter, provided in (5):

5) The Case Filter (Early Government & Binding (GB) Theory)

--> a. Every phonetically realized NP must be assigned (abstract) case (original version)

--> b. *NP if NP has phonetic form and no case (standard version)

(5) covers all NPs, including predicates, and under Minimalist assumptions, the distinction between arguments and predicates, in terms of case theory, should also not be relevant. As nominals, predicates have particular formal features, associated with the morphology with which they are selected into the Numeration, which must be checked off during the course of a convergent derivation, as discussed in Chomsky (1995):

6) "Generalizing the checking theory, let us assume that, like verbs, nouns are drawn from the lexicon with all of their morphological features, including Case and Φ-features, and these too must be checked in the appropriate position... This checking too can take place at any stage in a derivation to LF." (Chomsky 1995: 196-197)

I will show that (6) is true in the same way for predicates just as it is true for arguments, that is, that there are instances of structural case on predicates, and there is "Lexical" case -- that is, morphological marking determined by features of a particular lexical item mediated the same way as with argument NPs. Under the system that emerges, "agreement" will indeed turn out to be epiphenomenal, as Maling & Sprouse claim, and "Sameness" will be seen to result from true structural identity. Thus predicate NPs will indeed turn out to get case via the same mechanisms as verbal arguments, a welcome and probably unavoidable result if the Minimalist case theory is at all on the right track. In the spirit of Maling & Sprouse, I propose a theory that eliminates recourse to special treatment of predicate case such as "default" case, "case by agreement", or Babby's (1989) "Semantic case" whereby *semantic case* includes any direct link between the semantics and the morphology, without any syntactic mediation. Indeed, in the course of the discussion we will also see instances in which one or the other pattern is absent for purely structural reasons, where a purely semantic approach would predict them both to be possible. Only in cases where both patterns are possible syntactically do semantic distinctions come in.

## 2 Slavic Predicate Case

In the Slavic languages, there are only two case patterns possible on secondary predicates (see Nichols 1973, 1981, Franks 1995, among many others). One pattern is known as the "predicate instrumental", the other I will call "Sameness of case".[3] The two are exemplified in (1a-b), repeated as (7) below:

7) Ja našel ego p'janym / p'janogo
$I_i$-Nom found $him_k$-**Acc** $drunk_k$-**Instr** $drunk_k$-**Acc**
"I found him drunk."

In this section, I provide the relevant patterns for arguments and adjuncts from various Slavic languages. (The distinctions are given in terms of syntactic context -- the reader should see that a purely semantic distinction is probably not directly derivable from the configurational generalizations given here.).

In Russian, primary predicates are marked with "Sameness", whereas all argument secondary predicates and NP adjuncts show Instrumental. Only AP adjuncts allow both. Examples are given in (8), (9-10), (11-12), and (13-14) respectively:

• Russian Primary Predicates: Only "Sameness".

8) a. Ivan -- durak. *b. Ivan -- durakom/duraka...
Ivan-NOM fool-**Nom** Ivan-NOM fool-**Instr/Gen** etc.

"Ivan is a fool"

c. Ivan -- glup(yj) *d. Ivan -- glupym/glupogo...
Ivan-NOM stupid-**Nom** Ivan-NOM stupid-**Instr/Gen** etc.
"Ivan is stupid"

• Russian Secondary Predicate arguments: Only Instrumental.

9) a. Ivan kažetsja glupym. / *glup / *glupyj.
Ivan-**Nom** seems stupid-**Instr** stupid-**Nom** (short or long)
"Ivan seems (to be) stupid."

b. Ivan kažetsja durakom / *durak
Ivan$_i$-**Nom** seems fool$_i$-**Instr** fool$_i$-**Nom**
"Ivan seems (to be) a fool."

10) a. Ja sčitaju Ivana glupym. / *glupogo...
I consider Ivan-**Acc** stupid-**Instr** stupid-**Acc**
"I consider Ivan stupid."

b. Ja sčitaju Ivana durakom / *duraka...
I-Nomconsider Ivan$_i$-**Acc** fool$_i$-**Instr** fool$_i$-**Acc**
"I consider Ivan a fool."

• Russian Secondary Predicate NP adjuncts *Only Instrumental.*

11) Oni nazvali ego direktorom / *direktora
they$_i$-Nom named him$_k$-**Acc** director$_k$-**Instr** director$_k$-**Acc**
"They named him director."

12) On rabotaet vračom / *vrač
he$_i$-**Nom** works doctor$_i$-**Instr** doctor$_i$-**Nom**
"He works as a doctor."

• Russian Secondary Predicate AP adjuncts Both, but "Sameness" restricted.

13) Ja našel ego p'janym / ?p'janogo [both possible]
I$_i$-Nom found him$_k$-**Acc** drunk$_k$-**Instr** drunk$_k$-**Acc**
"I found him drunk."

14) My tancevali golymi / ?golye [both possible]
we$_i$-**Nom** danced nude$_i$-**Instr** nude$_i$-**Nom**
"We danced nude."

In Polish, lexical category is relevant for primary predicates, where we find Instrumental on NPs and "Sameness" on APs, as shown in (15-16):

• Polish Primary Predicates APs = "Sameness", NP = Instrumental.

15) a. Jan-**Nom** jest głodny-**Nom** *b. Jan-**Nom** jest głodnym-**Instr**
Jan is hungry Jan is hungry

16) *a. Jan-**Nom** jest student.-**Nom** b. Jan-**Nom** jest studentem.-**Instr**
Jan is a student Jan is a student

• Polish Secondary Predicates "Sameness"

17) a. Znalazłem go pijanego / *pijanym
(POL)
I-found him-**Acc** drunk-**Acc** drunk-**Instr**
"I found him drunk."

b. Uwazam go za głupca / *głupcem
I-consider him-**Acc** as fool-**Acc** fool-**Instr**

In Serbo-Croatian, the argument/adjunct distinction appears more relevant. Instrumental is lexically selected by verbs such as *smatrati* ('to consider'), whereas adjuncts show "Sameness". This is shown in (18-19):

• Serbo-Croatian Secondary Predicate arguments: Instrumental (when selected by the verb)

18) a. (Ja) smatram ga budalom / * budala (SC)
**I-Nom** consider him-**Acc** a fool-**Instr** a fool-**Acc**
"I consider him a fool."

• Serbo-Croatian Secondary Predicate adjuncts: "Sameness"

19) a. (Ja) plešem go *b. (Ja) plešem golim.
I-**Nom** dance-1sg nude-**Nom** I-**Nom** dance-1sg nude-**Instr**
"I dance nude."

c. Našao sam ga pijanog *d. Našao sam ga pijanim
found aux-1sg him-**Acc** drunk-**Acc** found aux-1sg him-**Acc** drunk-**Instr**
"I found him drunk."

Thus we find that there is morphological parametrized variation with respect to the AP vs. NP distinction and the argument/adjunct distinction. Both these patterns of variation alone serve as an initial argument against the Semantic Approach to Predicate Case, in that the meaning of the verb or predicate in question is not directly relevant in determining the case variation. Further, it is clear that identical sentences in different but closely related languages can be marked with distinct morphology, despite having presumably identical semantics. In the next section, I provide the particular theory of predicational syntax that I assume and that provides a configurational framework for predicate case checking.

## 3 The Syntax of Predication

There are two major directions in the syntax of predication within the generative tradition, summarized in (20):

20) a. The Specifier Hypothesis (Stowell 1981, Koopman and Sportiche 1991)
i) The surface subject in MC predication originates universally in [Spec, V] (and raises)
ii) The surface subject in SC predication originates universally in [Spec, L] (L=Lex Cat)

b. The Functional Category Hypothesis (Chomsky 1995, Bowers 1993, Laurençot 1995, Stowell 1995)
i) In MC predication, the surface subject originates in a functional category outside minimal VP
ii) In SC predication, the surface subject originates in a functional category outside minimal LP

In this article, I will argue for a particular version of (20b), The Functional Category Hypothesis, namely that in which predication is directly represented by a functional category Pred(ication)P, as argued for extensively in Bowers 1993, 1997. Major characteristics of this theory are provided in (21):

21) a. There exists a functional category PredP (PrP) for every instance of "predication"

b. Every $I^0$ selects PredP (primary predication), some V's select PredP (secondary predication).

c. $Pred^0$ selects any lexical category as its complement; structurally, the traditional "predicate" is the $Pred^0$ complement.

d. Small clauses are PredP's, either selected (arguments) or adjoined (adjuncts).

e. Argument small clauses are raising structures.

r. Adjunct small clauses are control structures.

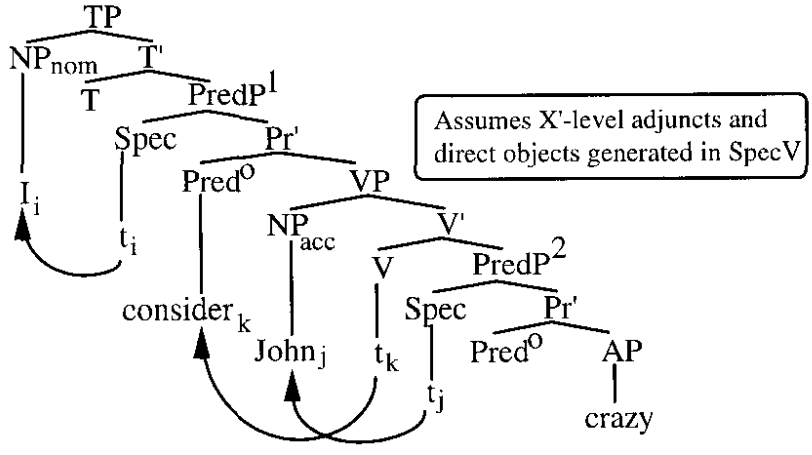
Examples of primary and secondary instances of PredP are given in (22):

22) a. I saw John in the kitchen. $Pr^0$ 1 selects VP, $Pr^0$ 2 selects PP
b. I consider John a fool. $Pr^0$ 1 selects VP, $Pr^0$ 2 selects NP
c. I saw John singing the blues. $Pr^0$ 1 selects VP, $Pr^0$ 2 selects VP
d. I consider John crazy. $Pr^0$ 1 selects VP, $Pr^0$ 2 selects AP

The structure of *I consider John crazy* is given in (23):

23) a. $[_{IP}$ I consider $[_{PrP}$ John $[_{Pr'}$ $[_{Pr}$ e $][_{AP}$ crazy$]$ $]$ $]$ $]$ (Bowers 1993: 595) = (9d)

b. Structure of (23a)[4]




It is beyond the scope of this article to provide a full justification for this approach to predication. However, a short discussion of its principle advantages other than those concerning Slavic predicate case are in order. To begin with, the PredP approach, first presented in Chomsky (1957), provides a particular syntactic configuration for the semantic

notion of predication. Second, it maintains both crucial aspects of the VP Internal Subject Hypothesis and a uniform X'-theory. Third, it allows for complex internal structure of predicates, as shown in (24):

24) I consider [$_{PredP}$ Fred [$_{DP}$ a mensch] / [$_{DP}$ the best person for the job] / [$_{DP}$Mary's worst enemy] ].

Fourth, it accounts for the exceptional ability of predicates to allow conjunction of (apparently) unlike categories, such as those shown in (25):

25) a. I consider Jim [$_{AP}$ crazy]] and [$_{DP}$ a fool]
b. I consider Jim [$_{AP}$ shrewd] and [$_{PP}$ in the know]

Under the PredP approach, (25) is represented as (26), immediately providing a constituency solution for (25), whereby it is in fact two PredPs that are conjoined, not two unlike categories:

25) a. I consider Jim$_i$ [$_{PrP}$ t$_i$ [$_{AP}$ crazy]] and [$_{PrP}$ t$_i$ [$_{DP}$ a fool]]
b. I consider Jim$_i$ [$_{PrP}$ t$_i$ [$_{AP}$ shrewd] and [$_{PrP}$ t [$_{PP}$ in the know]

Further, the PredP approach allows unergatives vs. unaccusatives to be distinguished structurally, provides the necessary number of adverb positions and provides for a reasonable classification for elements such as English *as* (see Bowers 1997 and Bailyn (forthcoming) for discussion). For our purposes, however, the most important advantage of the Bowers hypothesis is one not discussed in the original work at all, namely that it allows an elegant functional category account of case checking on predicates that is otherwise unavailable without additional stipulation. It is to that analysis that we now turn.

# 4 The Syntax of Slavic Predicate Case

The essential proposal of this section is that the two kinds of predicate case, Instrumental and "Sameness", correspond to the two familiar kinds of argument case: Lexical case and structural case respectively. Given the structures provided above under the PredP theory, these two case mechanisms can be implemented without any additional stipulations, thus supporting the direction of Maling & Sprouse (1995).

## 4.1 Lexically determined Predicate Case (Instrumental)

Typically, Lexical case on arguments is taken to differ from structural case in that it depends crucially on idiosyncratic case assignment properties of a particular head, usually a verb or preposition, whose exact case requirements must be stated in the lexicon (that is, they cannot be derived from the structure alone). Examples of Lexical case on prepositional and verbal arguments from Russian are given in (26). Violations are shown in (27).

26) Lexical case on arguments:

| Prepositions | | Verbs | |
|---|---|---|---|
| a. k | Ivanu | b. zavidovat' | Ivanu |
| to | Ivan-**Dat** | to envy | Ivan-**Dat** |
| c. u | Ivana | d. bojat'sja | Ivana |

| | | | | | |
|---|---|---|---|---|---|
| | at | Ivan-**Gen** | | to fear | Ivan-**Gen** |
| e. | c | Ivanom | f. | interesovat'sja | Ivanom |
| | with | Ivan-**Instr** | | to be interested in | Ivan-**Instr** |

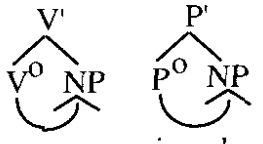
27) Lexical case violations (cf. 26)):

| | | | |
|---|---|---|---|
| k | *Ivane | / *Ivana | / *Ivanom |
| to | Ivan-**Prep** / | Ivan-**Gen** / | Ivan-**Instr** |

My claim is that the Instrumental case marking on Slavic predicates is similar -- it results from particular properties of the Pred$^0$ head itself, and cannot be directly derived from the configuration in which the predicate is located. Before turning to the exact mechanisms, however, it is necessary to take a look at how Lexical case might work under minimalist assumptions. Here I will maintain a view that is derived from its Government and Binding counterpart, and requires a minor revision of a basic assumption of the minimalist checking theory, without which Lexical and structural case cannot be adequately distinguished.

Recall that under GB theory, Lexical case involved direct case assignment under government to the complement of a theta-assigning head. Such a situation is sketched in (28).

28) Lexical case assignment (under GB theory):




(particular case assigned depends on the V or P)

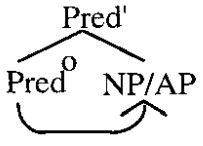
•• case assigned ••

In (29), I present the Predicate Instrumental Rule, based on work by Bailyn & Rubin (1991), which assumed exactly a Lexical case assignment structure.[5] The GB version of Lexical Predicate Case is given in (29), from Bailyn & Rubin (1991):

29) **Predicate Instrumental Rule** "Rule I" (Russian)

*Pred$^0$ assigns Instrumental Case to its complement*

30) Schematic view of Instrumental case assignment under GB theory




(particular case assigned depends on specific properties of Pred)

•• Slavic: Instrumental case assigned ••

Within Minimalism, Lexical Case has not been treated in a uniform fashion (although see Lasnik (1999) for relevant discussion.) The usual view of (structural) case checking as being the result of a Spec-Head relation cannot account for Lexical case because it cannot allow for the association with theta-role assignment, and because there is little evidence of raising of lexically-marked arguments into a higher specifier position. Thus Bailyn & Citko (1998) maintain the spirit of Bailyn & Rubin (1991) by introducing for such cases Check-on-Merge and the Complement Checking Domain as shown in (31a-b):

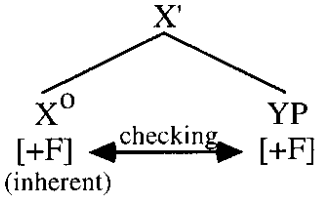
31) Lexical case checking (under Minimalism):

a. **Check-on-Merge** (Bailyn & Citko 1998)

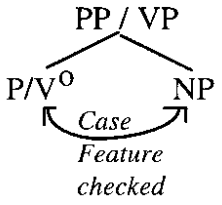
*Strong Inherent Case features must be checked on Merge*

b. **The Complement Checking Domain:**

i. General Schema



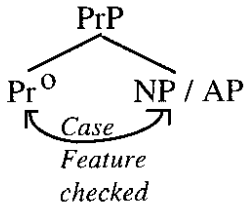

ii. Argument Case




(replaces lexical case assignment)

Given (31), which I assume to be independently necessary to maintain the tight connection in argument case between Lexical case assignment and theta-role assignment, (30) can now be simply restated as (32):

32) Predicate Instrumental Case Checking (replaces (30))



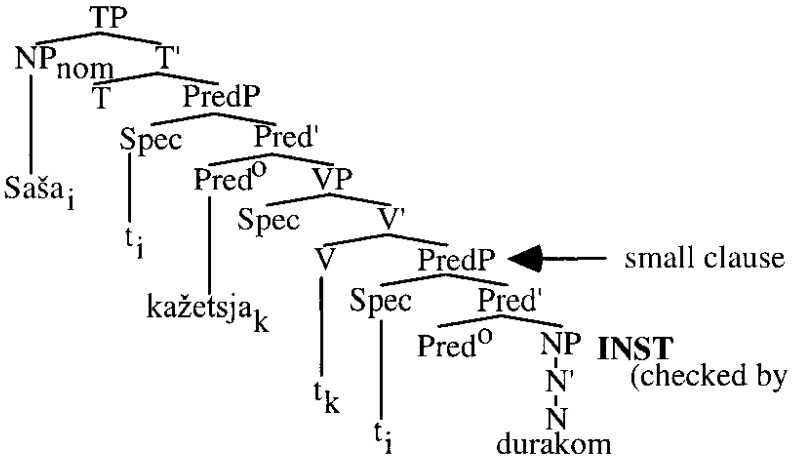

Examples of the workings of (32) are found in sentences such as (33):

33) a. Saša$_i$ kažetsja [$_{PredP}$ $t_i$ durakom]
Sasha-Nom seems fool-Instr
"Sasha seems to be a fool."

b. Ja sčitaju ego$_i$ [$_{PredP}$ $t_i$ durakom]
I consider him-Acc fool-Instr
"I consider him a fool"

In (33a), the subject of the small clause PredP raises to main clause Nominative case position, where it gets (checks) Nominative case. A tree structure, taken from Bailyn and Rubin 1991, is given in (34):

34) Structure of Russian argument small clause in (33a):




Sasha seems a fool

(33b) shows another instance of a selected PredP whose subject raises for case, this time to object position. I follow Larson (1988) and Bowers (1993) in assuming that Accusative objects are generated in (or raised to) SpecV, whereas lexically-marked objects are in the complement checking domain as shown above.

Adjunct small clauses can also show Instrumental case, as shown in (35a-c).

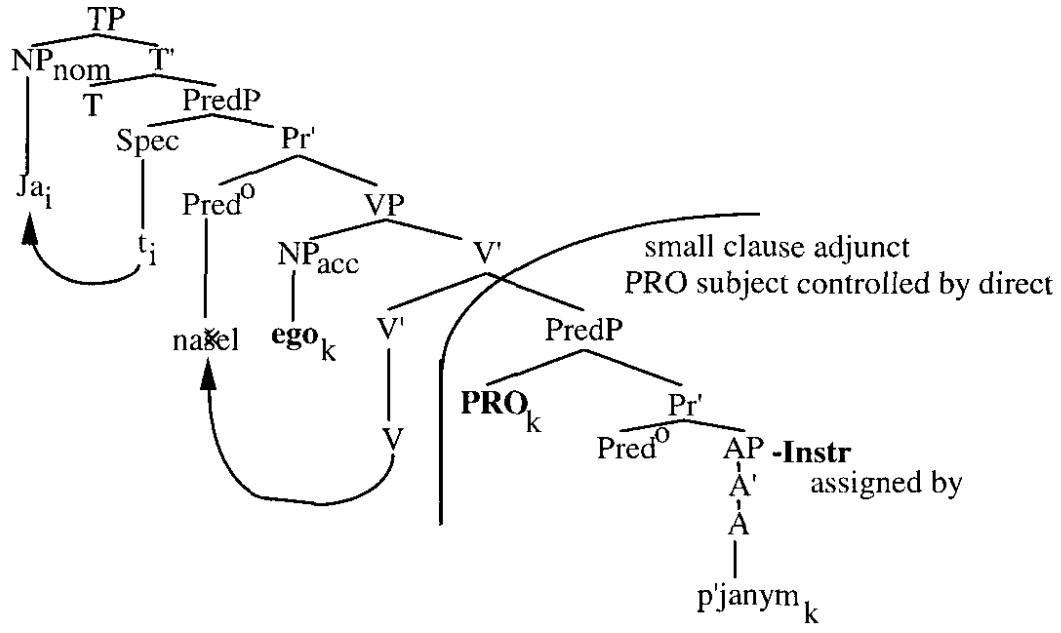
35) a. My$_i$ tancevali [$_{PredP}$ PRO$_i$ golymi.]
we-**Nom** danced nude-**Instr**
"We danced nude."

b. Jel'cina$_i$ vybrali [$_{PredP}$ PRO$_i$ prezidentom]
Yeltsin-**Acc** elected-3pl president-**Instr**
"They elected Yeltsin president"

c. Ja našel ego$_k$ [$_{PredP}$ PRO$_k$ p'janym
I$_i$-Nom found him$_k$-**Acc** drunk-**Instr**
"I found him drunk."

In these cases, the subject of the PredP secondary predicate is large PRO, whose reference is determined by control, theory in the standard fashion. (35a) exemplifies an adjunct small clause controlled by the subject and (35b-c) ones controlled by the direct object. The structure of (35c) is given in (36):

36) Structure of (35c) (=(1b))




I found $him_k$ PRO $drunk_k$

Further, I assume a theory of control that meets the Minimal Distance Principle (MDP):

37) Minimal Distance Principle:

*PRO is controlled by the nearest c-commanding potential antecedent*

I also assume, following Bowers (1993), that adjuncts are adjoined at the X'-level. Secondary PredP adjuncts are therefore adjoined to V'. Given the placement of direct objects in SpecV and oblique objects in the complement position, this approach predicts the impossibility of Instrumental small clauses with oblique controllers, a prediction that is strongly borne out by the facts, as shown in (38):

38) a. Boris sovetoval Saše golym (??golomu)
$Boris_i$-**Nom** advised $Sasha_k$-**Dat** $nude_{i\ /\ *k}$-**Instr** $nude_k$-**Dat**
"Boris advised Sasha nude." (Boris = nude)

b. Boris pozvonil Saše golym.
$Boris_i$-**Nom** telephoned $Sasha_k$-**Dat** $nude_{i/*k}$-**Instr**
"Boris telephoned Sasha nude." (Boris = nude)

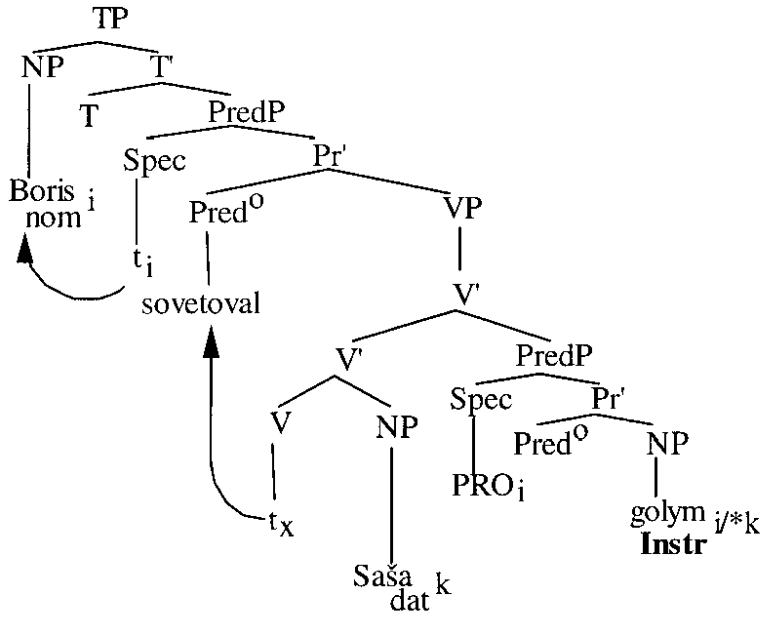
c. Boris bojitsja Saši golym.
$Boris_i$-**Nom** fears $Sasha_k$-**Gen** $nude_{i/*k}$-**Instr**
"Boris fears Sasha nude." (Boris = nude)

d. Boris posmotrel na Sašu golym.
$Boris_i$-**Nom** looked at $Sasha_k$-**Acc** $nude_{i/*k}$-**Instr**
"Boris looked at Sasha nude." (Boris = nude)

Comparing the tree in (36) with (38a-d), we see that whereas in (36) the controller of PRO is the internal argument, in (38a-d) it cannot be. This falls out from the structures assumed because (36) containsa direct object, whereas the arguments in (38a-d), all being lexically case marked, are never in high enough position to control the PRO subject of the PredP

adjunct, adjoined at V'. The problem is demonstrated in (39), in which the Dative argument does not c-command the PRO subject of the adjunct PredP.

39) Structure of (38a)




* Boris-Nom advised Sasha-Dat nude-Instr

Thus (39) demonstrates that the configurations proposed account for the lack of oblique controllers, something the semantic Approach to Predicate Case cannot do, at least in the form currently given. Thus the account of Instrumental case on predicates as Lexical case provides further evidence for the Syntactic Approach to Predicate Case. In the next section, we turn to the "Sameness" cases, and show that these correlate with instances of structural argument case, thus further strengthening the syntactic approach.

## 4.2 Structurally determined Predicate Case

Given the framework provided above, we are now in a position to provide a useful account of the cases in which the predicate shows the same case as a structurally marked argument in the sentence. First, recall that these occur in certain languages in exactly the same sentences in which Russian shows Instrumental. This is shown in (19), repeated as (40) below, from Serbo-Croatian

40) a.(Ja) plešem go *b. (Ja) plešem golim.
I-**Nom** dance-1sg nude-**Nom** I-**Nom** dance-1sg nude-**Instr**
"I dance nude."

c.Našao sam ga pijanog *d. Našao sam ga pijanim
found aux-1sg him-**Acc** drunk-**Acc** found aux-1sg him-**Acc** drunk-**Instr**
"I found him drunk."

(40a) and (40c) show occurrences of "Sameness" in PredP adjuncts, controlled by the nominative subject and the accusative direct object respectively. The impossibility of (40b) and (40d) with Instrumental predicates demonstrates that the situation is quite different from Russian, in which Instrumental is preferred but "Sameness" is also possible (we return to this distinction below). Given Minimalist assumptions about language variation, we expect the distinction between the two languages to reduce to a difference in the feature makeup of the Pred$^0$ head itself. We have seen that in Russian the Pred head is marked with inherent [+Instr] feature that is checked against the Instrumentally-marked NP or AP predicate in its

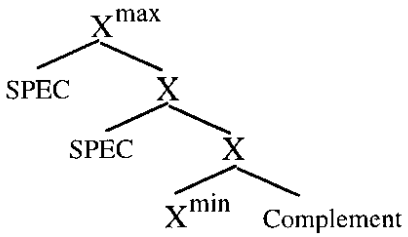
complement position. Clearly, the same Pred head in Serbo-Croatian is lacking in this Instrumental feature, or indeed any inherent case feature. In its absence, the actual case occurrence depends on the structure. Specifically, in the absence of a case-checking Pred$^0$ head, the NP or AP predicate must raise into a(n already existing) case position to have its case checked. Thus these nominals raise to get case.[6] "Sameness" marking on predicates parallels structural case marking on arguments. The general situation is summarized in (41)

41) The typology of non-Instrumental predicate case

*Structural Case results from there being no case feature on the relevant Pred$^0$*

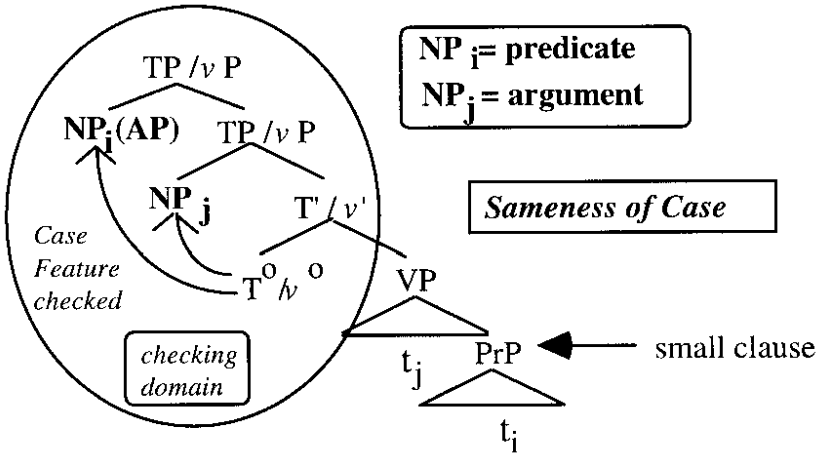
The relevant mechanisms,based on Bailyn & Citko (1998), require no additional stipulations: If Pred$^0$ has no case feature, its complement has no source of case in its base position and must raise to structural case position to check case. Assuming the existence of **double layered specifier** (Chomsky 1995, Koizumi 1995), schematized in (42), we can see the source of the structural case marking in "Sameness" cases:[7]

42) Double layered specifiers (Koizumi 1995, p. 138)



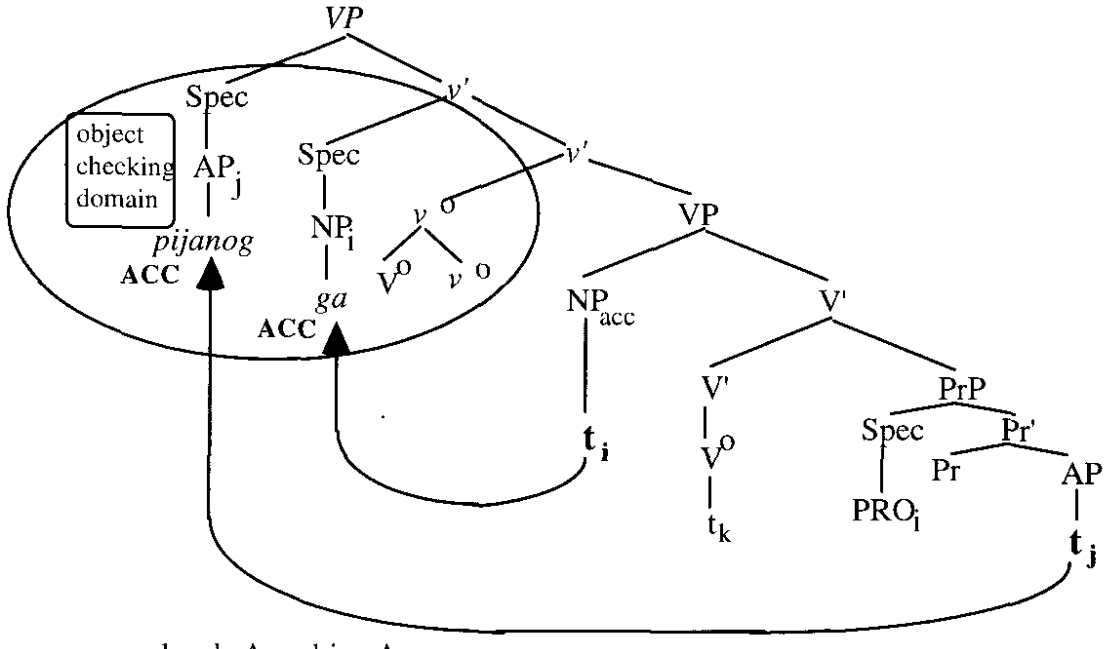

In (42), both the predicate NP and the argument NP check case against the relevant functional category. This is exactly what we find in "Sameness" predicate marking, now clearly analyzable as a form of structural case. The general schema for such cases is shown in (43):

43) LF Configuration for Structural Case on Predicates:




LF movement of the uncased Predicate occurs to the closest structural case checking position, producing the "Sameness" of Case effects, and limiting them to structural case. The relevant portion of the LF structure of (40c) is given in (44):

44) LF Structure of the Accusative checking domain of (40c):




drunk-Acc him-Acc ...

We can now reduce the morphological difference between Serbo-Croatian and Russian small clause predicates to a typological difference in the feature make-up in the Pred$^0$ head. A schematic version of the feature makeup of Pred is shown in (45):

45) Pred$^0$ features:

| Russian Polish | Serbo-Croatian | Germanic |
|---|---|---|
| [+Instr] [+Instr] | [-Instr] | [+Acc] |

## 5 Extensions

As presented, the analysis here provides a syntactic framework under Minimalism for maintaining the spirit of the Maling & Sprouse 1995 approach to predicate case. Under this approach, predicate case occurrences mirror argument case even more exactly than previously proposed, in that we have instances of both Lexically and Structural case, just as we do for arguments. Furthermore, all Lexical case occurrence are checked in complement position of a Lexical case assignor. All Structural case occurrences are checked in a Spec-Head configuration. Thus the general picture of the syntax of case is simplified by its extension to predicates.

We now have purely syntactic accounts of the paradigms given above -- the presence or absence of a strong inherent case feature on Pred$^0$ determinies whether an invariant inherent case will be assigned, such as the Slavic Instrumental, or whether "Sameness" results from a structural case doubling process when Pred$^0$ cannot check case. The impossibility of "Sameness" in Russian argument small clauses is accounted for by the selectional properties of verbs like *consider* which select PredP complements whose heads must check Instrumental.

However, various questions are raised by the analysis above that warrant further discussion. These questions are listed in (46):

46) Questions about the PredP account of predicate case:

I. Why do overt instances of Pred disallow Instrumental case?

II. Why does Russian primary predication not show Instrumental case?

III. How do we account for the Polish AP/NP distinction in copular sentences?

IV. How do we account for "Sameness" on Russian small clause APs such as (1b)?

In the next section, we present brief answers to these important questions. (For more discussion, see Bailyn & Rubin (1991), Bailyn & Citko (1998), and Bailyn (forthcoming)).

## 5.1 Overt predicators

In Bailyn (forthcoming) I use the same framework presented here in analyzing the status of certain pieces of morphology in Slavic as overt heads of the PredP functional category. Standard examples of these elements, from Russian, are given in the (b) sentences of (47-48):

47) a. On vygljadit Ø durakom / *durak
he-**Nom** looks fool-**Instr** / *-Nom
"He looks (like) a fool."

b. On vygljadit kak durak / *durakom
he-**Nom** looks PRED fool-**Nom** / *fool-**Instr**
"He looks like a fool."

48) a. My sčitaem ego Ø svoim / *svoego
we consider him-**Acc** self's-**Instr**/ *-**Acc**
"We consider him (as) one of us."

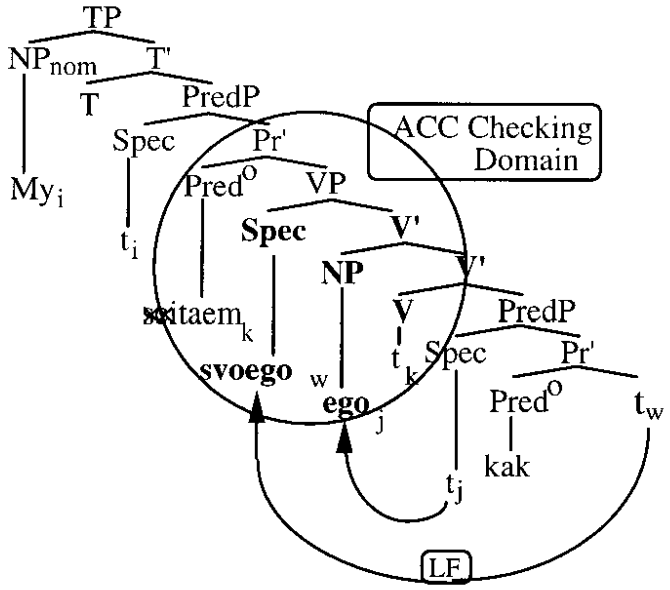
b. My sčitaem ego kak svoego / *svoim
we consider him-**Acc** PRED self's-**Acc** / ***-Instr**
"We consider him (as) one of us."

In (47a), we see an NP predicate marked with Instrumental case, checked in a standard Lexical case configuration with a Pred head that has Instrumental case features, as expected in Russian. (47b), on the other hand, has the element *kak*, analyzed in Bailyn as the head of PredP. Similarly, in (48), when *kak* is present, Instrumental on the predicate AP becomes impossible where it is otherwise required. Indeed, it is well-known that Instrumental is *always impossible* whenever an element such as *kak* fills the $Pred^0$ head. I draw on ideas of Bowers (1993) for English and Bailyn & Citko (1998) in showing that the presence of such elements precludes Instrumental case. I adopt the Morphological Pred Rule of Bailyn & Citko (1998), given in (49):

49) Morphological Pred Rule (MPR): (from Bailyn & Citko 1998)
Overt morphology in $Pred^0$ absorbs Instrumental Case

(49) has the status of a descriptive generalization, similar to the generalization that passive verbs cannot assign Accusative case. When an NP is generated as the direct object of a passive verb, it must move to get case, which is exactly what happens when an NP or AP predicate is generated as the complement of a filled Pred. The structure of (48b) would then be something like (50):

50) Structure of (48b)




(*kak* absorbs case from Pr, object must raise for Case)

we consider him as our own

The case absorption hypothesis accounts for the impossibility of overt predicators co-occurring with Instrumental predicates. It is not clear how this regular alternation would be handled in other frameworks.

## 5.2 Primary Predicates

In primary predication in Slavic (Russian and Polish), we find a second occurrence of Nominative, rather than Instrumental on the NP or AP predicate. This is shown in (51):

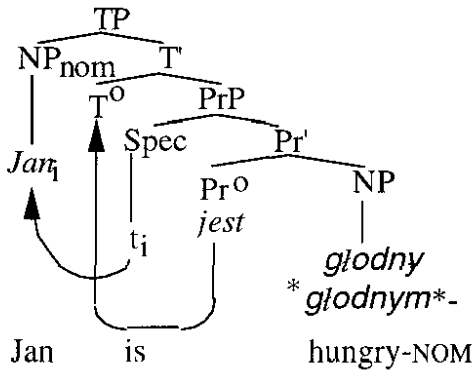
51) a. Boris byl muzykant. (R)
Boris-**Nom** was musician-**Nom**
"Boris was a musician (in his very nature).

b. Jan jest głodny (P)
Jan-**Nom**is hungry-**Nom**
"Jan is hungry"

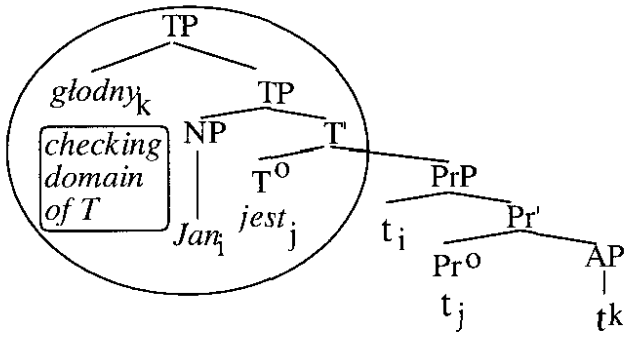
c. Jan to student. (P)
Jan-**Nom**? student-**Nom**
"Jan is a student."

These constructions are analyzed in Bailyn (1995) for Russian and in Bailyn & Citko (1998) for Polish as instantiating verbless structures where the 'to be' element occupies the head of (primary) PredP. In these cases, therefore, *to be* also serves as an overt predicator. These cases crucially do not involve secondary predication, and as a result have a highly equative meaning.[8] The surface and LF structures of (51b) are given in (52):

52) a. Surface (spell-out) structure of (51b) *Jan jest głodny* "Jan is hungry."




b. LF structure of (51b) *Jan jest głodny* "Jan is hungry."




We now can extend the analysis of Polish *to* to constructions like (51c) thus explaiing both its category and the required double Nominative case marking as another example of "Sameness" arising from the effect of an overt predicator.

There remains the issue of Russian present tense double nominatives ('Ivan -- student') which have no overt form of *to be*. Following previous work (Bailyn & Rubin 1991, Bailyn 1995, Bailyn & Citko 1998), I assume that these too are non-verbal sentences, similar in structure to (52), with an overt predicator (the verb *to be*) whose present tense form happens to be (morphologically) null. However, from the point of view of this article, this is still an overt predicator, simply one that is null on the surface. In this sense, the head of primary Pred$^0$ is filled, simply the morphological form is zero. This differs from secondary predicates where there is nothing in the head of Pred (except the strong Instrumental case features). This appears at first glance to be something of a non-natural class (overt morphology like *kak* or null copular morphology). However, in both cases we have material relevant to an interface, PF and LF respectively. Only in cases where there are no interface-interpetable features (such as null secondary Pred$^0$), can the Instrumental case feature be carried.[9] For more discussion see Bailyn & Citko (1998) and Bailyn (forthcoming).

## 5.3 Polish copular sentences

Recall that in Polish present tense copular sentences with *jest* ('is'), AP predicates and NP predicates show a morphological distinction, shown in (50).

| | | | | | |
|---|---|---|---|---|---|
| 53) | a. Jan | jest | studentem | / *-student | (NP) |
| | Jan -**Nom** | is | student-**Instr** | / *-**Nom** | |
| | "Jan is hungry" | | | | |
| | b. Jan | jest | głodny | / *głodnym | (AP) |
| | Jan -**Nom** | is | hungry-**Nom** | / *-**Instr** | |
| | "Jan is hungry" | | | | |

In (53a) we see that NP predicates must be marked Instrumental whereas (53b) shows that AP predicates must be marked Nominative ("Sameness"), as analyzed above. This restriction on Polish *jest* constructions can be reduced to a selectional restriction on the overt predicator: *jest* only takes AP complements. The other overt predicator in Polish, *to*, is the oppsoite: it only takes NP complements.[10] Thus (53a) involves secondary predication, and an occurrence of *jest* as a raising verb, and as such is essentially identical to the Russian raising verb schematized in (34) above.

## 5.4 Russian "Sameness" without overt predicators

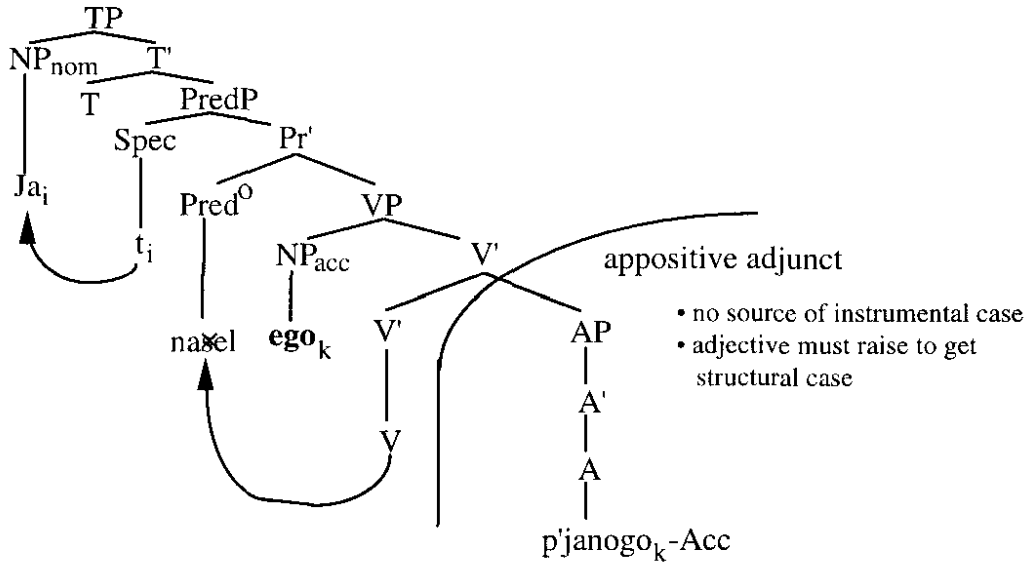
Finally, we are in a position to return to the alternation we began with in (1), repeated as (54) below, in which Russian adjunct small clauses appear to allow both Instrumental and "Sameness".

54) a. Ja našel ego p'janym
$I_i$-**Nom** found $him_k$-**Acc** $drunk_k$-**Instr**
"I found him drunk."

b. ?Ja našel ego p'janogo
$I_i$-**Nom** found **$him_k$**-Acc $drunk_k$-**Acc**
"I found him drunk."

Further, these are the cases that involve a semantic distinction between the two case alternations, discussed in Hinterhoelzl (this volume) and Kennedy & Filip (this volume). Given the analysis of Russian predicative case presented above, there are two possibilities that can account for (54b). First, we could analyze (54b) as structurally identical with (54a), but with some kind of defective case assignor in the head of PredP (that is, a $Pred^0$ head that for whatever reasons fails to have the strong inherent Instrumental case feature that characterizes all other Russian secondary predicates.) This is essentially the approach taken in Bailyn & Citko (1998). For this to go through, however, we would need to ensure that PredP whose heads have this defective character could never be selected as the complement of raising verbs such as *consider* or *seem*, which in Russian only allow Instrumental complements, as we have seen. Secondary predicates showing "Sameness" in Russian occur only with overt morphology. Since it would be difficult to claim that in (54b) Pred is "overt", when there is no morphology present, nor any LF-relevant features, it appears that an analysis with identical structures in (54a) and (54b) is difficult to maintain. This leads us to the other possibility, namely that in (54b) there is simply no PredP structure at all. If we allow for the possibility of true "appositive" adjuncts, we would predict that in the absence of a Pred head, the only possible source of case for the predicate would involve LF raising into the specifier of a case checking head, and hence a "Sameness" effect. Such a small clause would look much like the small clauses proposed by Stowell, which would constitute examples of the Lexical Case Hypothesis for small clauses, in these cases only. Thus the structure of (54b) would look something like (55):

55) Structure of (54b) (= (1b))




There are three arguments in favor of the appositive approach taken here over that of the defective Pred$^0$ head approach suggested in Bailyn & Citko (1998). First, it explains why the alternation between Instrumental and "Sameness" in Russian is possible only in adjunct cases; in argument small clauses the categorial status of the verbal complement is determined by selectional requirements of the verb (*consider* requires a PredP complement) and an appositive "Sameness" structure is impossible. Second, it predicts the existence of a semantic distinction between a true secondary predicate, with a full PredP structure, and the appositive small clauses of the type shown in (55). This provides a structural basis for the distinction discussed under the Semantic Approach to Predicative Case. Because this only occurs in adjunct position, it allows us a syntactic characterization of the situations in which the semantic distinction discussed in the other papers in this volume can operate, and provides for those accounts a structural correlation. In this sense, the account suggested here solves a potential problem for the Semantic Approach to Predicative Case choice, namely how to explain why a distinction in the meanings between the Russian options (1a) and (1b), holds here, but does not obtain with respect to the cross-linguistic distinction in cases such as Russian (1a) and its Serbo-Croatian equivalent (36b) which have exactly the same interpretation. In fact, if this article is on the right track, the semantic distinction does not depend on Instrumental vs. "Sameness" but reduces to PredP structures vs. bare appositive-style small clauses. Third, the appositive account predicts that "Sameness" should be possible in cases where control theory disallows Instrumental case, namely in cases where the small clause predicate refers to an oblique/lexically marked argument of the main verb. Recall (38a), repeated below, in which Instrumental secondary predication referring to the Dative argument were impossible because of control theory.

38) a. Boris sovetoval Saše golym (??golomu)
Boris$_i$-**Nom** advised Sasha$_k$-**Dat** nude$_{i\,/\,*k}$-**Instr** nude$_k$-**Dat**
"Boris advised Sasha nude."

Notice, however, that a Dative "Sameness"-marked AP is marginally possible in this structure. This is expected only if c-command is *not* relevant for the structures involved. *golomu* is in the Complement Checking Domain of *sovetoval* which is responsible for the Dative case marking. Thus the appositive account can allow for such cases, whereas for the PredP account of "Sameness" in Russian, such cases constitute a serious problem. For these three reasons, I maintain that (55) is the proper analysis for (1b), and leave a characterization of the semantic distinction to the other papers in this volume.

# 6 Conclusion

In this article we have seen that a syntactic approach to the case alternations in Slavic predicates is fruitful in characterization the configurations that the different case patterns occur in. This approach is shown to have various advantages. For one thing, cross-linguistic variation reduces to the feature makeup of functional categories, as expected given Minimalist assumptions. Second, it allows us to eliminate any recourse to special case assignment mechanisms for predicative case, as well as any need for semantic case as something distinct from Lexical or structural case. In particular, predicative Instrumental requires the same mechanisms as other instances of inherent or Lexical case, and "Sameness" of Case on predicates reduces to structural case, given the possibility of a predicate and an argument sharing the specifier positions of a single case checking head. Further, we can maintain the usual view within generative grammar that the relation between semantics and morphology is mediated by configuration, and does not constitute a direct correlation. At the same time, the configurations proposed are rich enough to allow distinct structures to correlate with the semantic distinctions in those instances where both forms can occur. Finally, the account moves us one step closer to a strong theory of Case under Minimalism, under which all nominals would fall under one unified Minimalist Case Filter (MCF), along the lines of that proposed by Bailyn & Citko (1998), given in (56).

56) **The Minimalist Case Filter (MCF)**:

a. Every [+N] category must bear formal case features
b. Morphological case is a direct reflection of formal case features

The conclusions of this article allows us to extend the MCF neatly to predicates, not always covered by theta-theory driven versions of the Case Filter under GB Theory. It remains now only to provide distinct configurational checking mechanisms for adjunct (bare) NP adverbs, and we can unite all nominals under a case filter such as (56), increasing the simplicity of the grammar of natural language.

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## NOTES

[1]Maling & Sprouse limit their discussion to Germanic, and do not make a distinction between two kinds of case patterns. However their account is crucial in being the a strong proponent of treating case on predicates like case on arguments, a goal I share throughout.

[2]Late GB Theory derived the requirement that argument NPs, but not predicates, needed case from the "Visibility Condition" given in (i):

(i) The Visibility Condition: A chain is visible only if it has a Case position Arguments must bear Case, and predicates may not bear Case....

A more exact description is given in den Dikken & Næss (1993):

> Arguments, bearers of thematic roles, must be made visible for the Theta Criterion through the assignment of a Case feature; *predicates, on the other hand, do not impose this requirement, hence do not need Case.* Economy considerations then dictate that predicates are not allowed to bear Case. (den Dikken & Næss: 303-304)

I assume that elimination of such distinctions is a step forward in understanding the relation of morphology to syntax.

[3]This term is originally due to Wayles Browne, who related it exactly to avoid saying "agreement", which has acquired a new meaning since the advent of Minimalism, and which is misleading in its implication as to the right analysis of certain phenomena.

[4]Note that (23b) and trees throughout this article show verb raising to $Pred^0$. This assumption is taken from Bowers, and parallels obligatory V raising to *v* in Chomsky (1995). However, nothing crucial in the account follows from this raising. Not crucially that the verb does not raise as high as I in the overt syntax, as argued in Bailyn (1995).

[5]Here "lexical" refers to the lexically idiosyncratic nature of the case in question, and not to the nature of the *category* of the case assignor, which in the case of predicates is a functional head.

[6]At first glance it appears that we then predict "Sameness" nominals to end up in an LF position distinct from Instrumental Nominals. However, on the assumption that Agreement must also be checked on AP predicates, the Instrumentals presumably move at LF also, for independent reasons. Thus the LF positions of the different predicate types are not distinct.

[7]Double-layered specifiers are not generally allowed (or we would expect multiple occurrences of the same structural case regularly in language). I assume the general restriction against double-specifiers follows from the theta-criterion, stating that two theta-marked elements may not occupy the same structural position (at LF). If this is indeed the nature of the restriction on multiple specs, there appears to be no reason why the restriction should extend to predicates, which do not bear theta-roles. We would thus expect a predicate to be able to share specifierhood of a head with an argument, acquiring all of the same morphological characteristics by virtue of being in the checking domain of the same head.

[8]The alternative Instrumental forms found in Russian and with Polish NPs do not share this meaning, and as such can be analyzed as small clause raising construction similar to what we have already seen, where the 'to be' element is indeed a verb taking a small clause complement.

[9]Another possibility for reducing this correlation to something morphological involves treating certain $Pred^0$ heads as "affixal". All overt morphology in Pred would require [+affixal] Pred to allow both the morphology and the formal features of Pred to occupy one head position. Primary $Pred^0$, because they always raise to T, would also be affixal; (see 5.2) For now, I leave deeper explanation of the MPR to future research.

[10]This inverts the usual description of these facts, namely that *jest* licenses Instrumental on NPs and Nominative on APs, whereas *to* allows only Nominative. Rather, I propose *to* is unambiguously a head of Pred, taking NP complement and *jest* as Pred, takes only AP complements. *jest* also occurs as a raising verb, taking Instrumental complements. This predicts that Polish should allow some AP-instrumentals as well, which Przepiórkowski (2000) shows are possible, contra Bailyn & Citko (1998). *to*, on the other hand, does not double as a verb, therefore *to* with Instrumental is always impossible -- it is always an overt predicator so it always absorbs case.

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# The Syntactic Structure of Predicatives: Clues from the Omission of the Copula in Child English

## Abstract

This paper explores the syntax of main clause predicatives from the perspective of trying to account for an asymmetry in copular constructions in certain languages. One of the languages in which we find such an asymmetry is child English (around age 2). Specifically, new results show that children acquiring English tend to use an overt (and inflected) copula in individual-level predicatives, but they tend to omit the copula in stage-level predicatives. The analysis adopted to account for this pattern draws on evidence from adult English, Russian, Spanish and Portuguese that stage-level predicates are Aspectual (they contain AspP) while individual-level predicates are not (they involve only a lexical Small Clause predicate). Children's omission of the copula in structures with AspP is linked to the fact that at this stage of development, children fail to require finiteness in main clauses. In particular, $Asp^0$ is temporally anchored in child English, thereby obviating the need for a finite (temporally anchored) Infl, i.e. an inflected copula.

## 1 Introduction

Predicative expressions, which consist of a subject, a copula and a nominal, adjectival or locative (PP) predicate, can be categorized as stage-level or individual-level.

(1) Rodney is in the kitchen/tired. (stage-level)

(2) Rodney is a cat/fat. (individual-level)

This semantic contrast is well known. It is characterized by Carlson (1977) in terms of a difference in the sort of thing the predicate applies to. An individual-level predicate applies directly to an INDIVIDUAL (e.g. an object or a person), denoted by the subject. A stage-level predicate applies to a STAGE of the subject (i.e. (1) means that the predicate [in the kitchen] or [tired] applies to a stage of Rodney, not to Rodney himself.) A stage is defined as a spatio-temporal slice of an individual.

One approach to capturing this contrast is to say that the predicate in a sentence like (2) denotes a "permanent" property, while the predicate in a sentence like (1) denotes a "temporary" property. While this sort of generalization is true in many cases, it is not quite accurate and gives the false impression that we might be able to tell (1)- and (2)-type predicates apart based on the length of time the property holds. Instead, the argument made here is that the semantic difference between stage- and individual-level predicates should be analyzed as a difference of grammatical Aspect. Grammatical Aspect encodes information about the imperfectivity or perfectivity of an event or eventuality, and this information is encoded syntactically (i.e. by the projection of an Aspect

Phrase, the head of which contains features for (im)perfectivity).[1] More generally, Aspect asserts an eventuality of the predicate (e.g. in (1) it is asserted that an eventuality of Rodney's being in the kitchen or being tired is taking place). Since eventualities can be situated in time, predicates with Aspect can be said to be temporal in nature, as opposed to being atemporal. In clauses that lack Aspect no eventuality of the predicate is asserted; predicates in such clauses are atemporal.

The relationship between Aspect and the stage/individual distinction is that stage-level predicates project AspP (they are TEMPORAL) but individual-level predicates do not (they are ATEMPORAL).[2] Support for this position is provided from English perception verb constructions and from main clause predicatives in Spanish, Portuguese and Russian.

In addition to the proposal for a syntactic/aspectual analysis of the stage-/individual-level distinction, an independent proposal is made for the temporal anchoring of main clauses: main clauses must be temporally anchored to the discourse in order to receive temporal reference. The manner in which clauses are anchored is made explicit in section 5. The main contribution of this paper is that the proposal for a syntactic asymmetry between stage- and individual-level predicatives, coupled with the analysis of the temporal anchoring of main clauses, allows us to account for the pattern of omission of the copula in main clause predicatives in child English.

The rest of the paper is structured as follows. Section 2 goes through the basic semantic and syntactic distinctions between stage- and individual-level predicates, and some traditional accounts of the distinction are summarized. The syntactic distinctions in particular point to a difference of Aspect between the two types of predicatives (as mentioned above: stage-level predicates are argued to be aspectual, while individual-level predicates are non-aspectual). The following section provides further support for this view from adult non-English languages. Syntactic alternations in main clause predicatives in Russian (involving the case of the predicate), and Spanish and Portuguese (involving the form of the copula) suggest an alternation based on Aspect. In addition to adult grammars, we find an alternation in copular constructions in new data presented from child standard English. Here the alternation is in the overtness of the copula. The data show that children omit the copula in stage-level predicatives (clauses with Aspect) but tend to produce an overt copula in individual-level predicative clauses (those without Aspect).

In section 5, an account is given of the correlation between the presence of AspP in a clause and a null copula, and the absence of AspP and an overt copula in child English. The account is based on a requirement for temporal anchoring in main clause predicatives. In the final section, this account is shown to be extendable to cover the pattern of copula omission in adult Hebrew.

## 2 A Syntactic Asymmetry

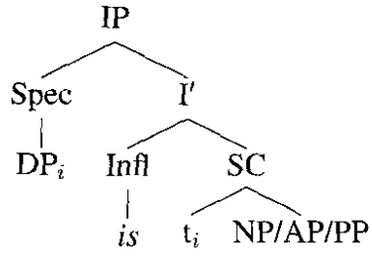
At first blush, the sentences in (1) and (2) above appear to have the same structure, modulo the different lexical categories of the predicates. We might adopt, as a point of departure, the basic structure in (3), following Stowell (1981).[3]

[1] I understand 'perfective' aspect to indicate a completed situation, or to refer to a situation in its entirety, while 'imperfective' aspect is understood to indicate an uncompleted situation, or to refer to the "internal temporal structure of a situation" (Comrie, 1976, p. 24). Henceforth I use the term 'Aspect' to refer only to grammatical, not lexical, Aspect.

[2] It is worth noting that Carlson also conceived of the stage/individual contrast as one involving a contrast in temporality. Carlson (1979) writes of the "basically atemporal nature of individuals as opposed to their time-bound stages." (Carlson, 1979, p. 57).

[3] That no VP is projected in this structure is due to the fact that I believe the inflected copula is simply the spell-out of finiteness features in Infl, rather than a raised verb. Arguments for this view are given in Becker (to appear).

(3)




However, there are a number of environments that distinguish stage- from individual-level predicates and thereby give us reason to think they might differ structurally. I will briefly go through the main diagnostics here.

One difference between stage- and individual-level predicates is that only stage-level predicates can be modified by a spatial or temporal modifier, as shown in (4a-b).

(4) a. Rodney is in the kitchen all the time.
b. ?? Rodney is a cat all the time.

(While certainly true, it is semantically odd to say that Rodney is a cat all the time; it seems to imply that there might be times at which he's not a cat, which is not possible in our world.[4])

In addition to modification by a temporal modifier, the ability to occur in a *when*-clause is a property of stage- but not individual-level predicates. This is shown in (5).

(5) a. When Rodney is in the kitchen, he eats my parsley.
b. ?? When Rodney is a cat, he eats my parsley.

According to Kratzer (1995), the reason (5b) is semantically ill-formed is that it lacks a semantic Event variable (Davidson, 1967): she argues that a *when*-clause contains an implicit ALWAYS operator that looks for a variable to bind in the restrictor clause. This need is satisfied in the structure in (6a), corresponding to (5a), but not in (6b), which corresponds to (5b).

(6) a. ALWAYS$_1$ [in–kitchen(Rodney, 1)][eat(Rodney, my–parsley, 1)]
b. * ALWAYS [a cat(Rodney)][eat(Rodney, my–parsley, 1)]

Assuming the constraint against vacuous quantification (i.e. that if there is an operator in an expression, there must be a variable in the restrictor clause for the operator to bind), (6b) is ill-formed because there is no variable in the restrictor clause ([a cat(Rodney)]) for the ALWAYS operator to bind. (6a), on the other hand, satisfies the constraint and is well-formed.

As for the fact that individual-level predicates resist modification by a temporal modifier, Kratzer claims that this is likewise captured by the fact that individual-level predicates do not contain an Event variable: it is the presence of this variable in stage-level predicates that allows such modification (the event itself gets modified).

A further semantic difference between stage- and individual-level predicates is that stage-level predicates admit an existential (weak) reading of a bare plural subject, while with individual-level predicates the subject can have only a generic interpretation, as in (7a-b).

[4]The interesting issue of how predicates can be coerced into having a temporary or permanent meaning, contrary to their natural tendency, will not be taken up here. See Fernald (2000) for discussion.

(7) a. Cats are in the kitchen. (existential ok)
b. Cats are mammals. (generic only)

Kratzer follows Diesing (1988, 1992) in accounting for this contrast in terms of the syntactic position of the Event argument. Namely, the Event argument is in SpecIP, and the subject of a stage-level predicate is generated lower in the structure, i.e. in SpecVP. Since the Existential Operator, $\exists$, is taken to be projected at the VP boundary and the Generic Operator, Gen, at the IP boundary, only elements within VP can receive an existential reading. Elements outside of VP, i.e. in IP, must be interpreted in the scope of the Generic operator.

These differences between stage- and individual-level predicates are semantic in nature and therefore call for a semantic-based account, which is what Kratzer provides. However, there are other contrasts that suggest a syntactic distinction between these two types of predicates. In particular, the unacceptability of individual-level predicates in perception verb complements is syntactic, not semantic in nature (i.e. (8b) is ungrammatical, not semantically ill-formed).

(8) a. I saw Rodney in the kitchen.
b. * I saw Rodney a cat.

A similar contrast is found in the coda of existential constructions.

(9) a. There are doctors in the corridor.
b. * There are doctors women.

What is the syntax of these constructions such that they allow only stage-level predicates to occur in them? Felser (1999) argues that perception verb complements (henceforth PVCs) contain AspP as their highest projection. Felser shows that the reduced clausal constituent under a perception verb involves more structure than a VP (it can host expletive subjects, as in (10a)) but less than a TP (it cannot be tensed, as in (10b)).[5]

(10) a. I wouldn't like to see [there be so many mistakes]
b. * I saw John draws/to draw a circle

Rather, she argues that the relevant level of projection is the functional projection between VP and TP, namely AspP (Travis, 1992). We might add that the head of this projection may be specified either as [+perf] or as [–perf] to capture the difference between (11a) and (11b), respectively.[6] (11a) denotes a closed eventuality (hence perfective), while (11b) denotes an ongoing (not closed) eventuality (hence imperfective).

(11) a. I saw John draw a circle.
b. I saw John drawing a circle.

[5]The embedded clause under a perception verb can be infinitive if the main clause is passive: *John was seen to draw a circle*. I won't deal with these constructions here.

[6]Felser uses [±progressive] as the feature of the Asp head. However, since we will apply the same structure to non-verbal predicates, which are not progressive, the [±perfective] feature seems more appropriate, at least to the constructions under consideration here. I believe this is not more than a notational change.

Since (im)perfectivity is what gets expressed by grammatical Aspect, and since the PVCs in (11a) and (11b) express perfectivity and imperfectivity, respectively, these predicates project an AspP.

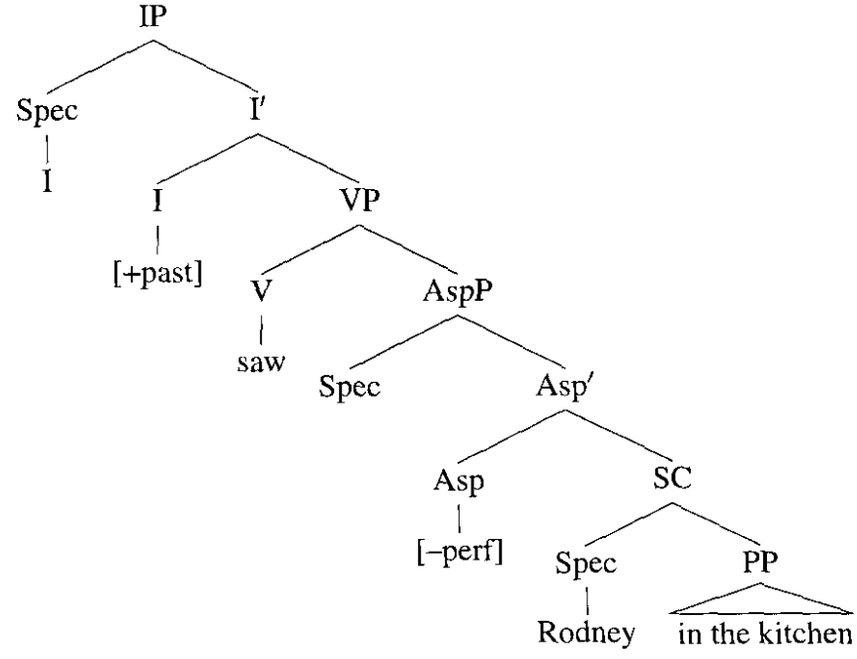
(As a side note, Felser brings another argument for projecting AspP in PVCs: it is that PVCs can host eventive but not stative verbal predicates, and she associates only eventive (not stative) predicates with the projection of an Event argument. Furthermore, Felser places the Event argument in SpecAspP. Thus, sentences like (12b) are ruled out because they do not project an Event argument, and hence cannot occur with AspP:

(12) a. I saw John draw a circle.
b. * I saw the book lie on the table.[7]

While I do not adopt the view that only eventive predicates project an Event argument, the asymmetry between eventive and stative verbs in this environment is notable and must be accounted for. If there is an association between eventive verbs and Aspect that stative verbs do not share, the asymmetry in (12) is expected. Furthermore, an eventive/stative asymmetry arises in existential codas, another environment in which only stage-level predicates can occur: see below.)

We adopt Felser's view that PVCs involve AspP as the highest functional projection, and a non-verbal PVC, such as (8a) above has the structure in (13).

(13)




A sentence like (8b) is ruled out because individual-level predicates do not project AspP, so the ungrammaticality of (8b) results from a selectional problem: individual-level predicates are non-aspectual and so are incompatible with AspP, yet AspP must be projected in a perception verb complement. The head of AspP in (13) is indicated as [–perf] (i.e. imperfective) rather than [±perf] as in the verbal PVC above because the predicate in (13)/(8a) does not denote a closed or completed eventuality. Instead, it is compatible with a continuation clause such as ... *and he's*

[7]Stative verbs may occur in progressive form in this environment (e.g. *I saw the book lying on the table*). However, these cases can be shown to involve a reduced relative clause, rather than a true perception verb complement structure. See Felser (1999) for discussion.

*still there*. An imperfective verbal PVC such as (11b) likewise can be continued with ... *and he's still drawing it*, but a perfective PVC such as (11a) cannot be continued so: **I saw John draw a circle, and he's still drawing it.*[8]

As for the exclusion of individual-level predicates in existential codas (cf. (9)), I will speculate that this can be argued to follow from the same restriction on predicates in PVCs. Namely, existential codas contain AspP. Notably, when the coda contains a verbal clause the verb must be eventive and must appear in progressive aspect.

(14) a. There are children playing in the yard.
b. ?* There are children knowing that song.

(15) a. * There are children play in the yard.
b. * There are children know that song.

The contrast between (14a) and (14b) seems to suggest that existential codas, like PVCs contain AspP as the highest projection (if there is a connection between eventive predicates and Aspect, as suggested above). The ungrammaticality of (15a-b) can be accounted for by limiting the feature of $Asp^0$ to [–perf]. That the head of AspP in an existential must be [–perf] receives some support from Giorgi and Pianesi's (1996) claim that English bare verbs are inherently perfective. As perfective predicates, they cannot be predicated of a "here and now" event. But according to Guéron (1995) existential *there* is a pronoun that denotes a time and place, i.e. it anchors the expression to the here and now. Thus, if existentials denote a here and now situation, then they should be incompatible with a perfective predicate, thus ruling out bare verbal predicates.[9]

## 3 Further Evidence that S-level Predicates Contain AspP

In addition to (certain) English embedded clauses, there is some evidence from other languages that stage-level predicates (or at least predicates that denote a more or less temporary property) should be associated with the projection of AspP. The languages I will discuss here are Russian, Spanish and Portuguese.

### 3.1 Russian

In Russian past tense predicative constructions, the nominal or adjectival predicate may bear either Nominative or Instrumental case.[10] But the difference in case marking corresponds to a difference in meaning between the two predicates. A Nominative predicate has a permanent or inherent meaning, while an Instrumental predicate has a more temporary meaning, as shown in (16-17) (from Pereltsvaig (1999); see also Bailyn and Rubin (1991); Déchaine (1993)).

(16) a. Oleg byl durakom.
Oleg-Nom was fool-Instr
'Oleg was a fool (sometimes he'd behave like a fool)'

[8]The perfective/imperfective contrast can be seen more clearly with the predicate *drown*. Compare: *I saw Bill drowning, but I rescued him* vs. **I saw Bill drown, but I rescued him*. See Felser (1999) for discussion.

[9]I thank Nina Hyams for this suggestion and for discussion on this point.

[10]Russian predicatives in present tense always contain a null copula (never an overt one), and the predicate always bears Nominative case. I will not discuss present tense constructions here; but see Kondrashova (1996) for discussion.

b. Oleg byl durak.
Oleg-Nom was fool-Nom
'Oleg was a fool (by nature, he was a foolish person)'

(17) a. Pjatno bylo krasnym.
spot-Nom was red-Instr
'The spot was red (and then it changed color)'

b. Pjatno bylo krasnoe.
spot-Nom was red-Nom
'The spot was red (as long as there was a spot, it was red)'

Matushansky (2000) argues that Instrumental case is checked in SpecAspP, and therefore that predicates marked with Instrumental case project AspP. Her claim is twofold: one part involves evidence for an extra projection in Instrumental predicatives that is absent in Nominative predicatives, and the second part involves evidence that the extra projection in Instrumentals is Aspect. Let us look at the two claims individually.

Her evidence for the claim that Instrumental predicates involve an extra functional projection comes from extraction asymmetries between Nominative and Instrumental predicatives: in cases of Wh-extraction, scrambling and extraction from embedded clauses, extraction of the predicate is possible only when the predicate bears Instrumental case. An example of this asymmetry in scrambling is given below.

(18) a. Velikim poètom byl Pushkin.
great poet-Instr was Pushkin
'Pushkin was a great poet.'

b. * Velikij poèt byl Pushkin.
great poet-Nom was Pushkin

Thus, she argues, the structure of clauses containing Instrumental predicates must be such that there is a position through which the predicate can move as it raises in the structure (cf. (18a)). This position must be absent in clauses containing Nominative predicates, since these predicates are not able to raise (cf. (18b)).

Matushansky's reason for invoking AspP in particular as the locus of Instrumental case checking (and the position through which the predicate may move) has to do with a more general association between Instrumental case and (im)perfectivity. In the above examples, the past tense copula *byl* 'was' is not marked for aspect. It may, however, occur in a form that bears an explicit morphological affix indicating (perfective or imperfective) Aspect. In this case the predicate must bear Instrumental case; Nominative is ungrammatical.

(19) Ja pobyla/byvala zavedujuščeh/*zavedujuščaja.
I was-perf/impf manager-Instr/*Nom
'I was/have been a manager'

This datum illustrates the connection between Instrumental case and Aspect: when the copula is explicitly marked for Aspect, the predicate can only have Instrumental case. Following Matushansky, this connection between Instrumental and Aspect should extend to those clauses where the copula does not bear any explicit aspectual morphology. That is, in past tense main

clause predicatives such as (16a), if the predicate is marked with Instrumental case AspP is projected in the clause.

It is true that the semantic distinction found in Russian between Nominative and Instrumental predicates is not exactly the stage/individual distinction. At least, it is not the same distinction that is drawn in English (since, according to Carlson (1977), all nominal predicates are individual-level). Nevertheless there is a semantic difference between the predicates in the (a) and (b) examples in (16-17), and this semantic difference, namely that the one sort of predicate denotes an atemporal property and the other sort denotes a temporal property, is quite similar in nature to the difference between individual-level (atemporal) and stage-level (temporal) predicates. What I am suggesting here is that both distinctions should be accounted for in terms of the presence vs. absence of AspP in the syntax.

### 3.2 Spanish and Portuguese

In Spanish and Portuguese there are two copulas that both translate in English as *be*: *ser* and *estar*. The general distribution of these copulas is that *ser* occurs with individual-level predicates, and *estar* occurs with stage-level predicates, as in (20) from Spanish (see e.g. Sera, 1992; Luján, 1981; Bull, 1965; Roldan, 1974).

(20) a. Juan es/*esta un hombre/grande.
John is-ser/*estar a man/big
'John is a man/big'

b. Juan esta/*es en la casa/cansado.
John is-estar/*ser in the house/tired
'John is in the house/tired'

Like their English counterparts, Spanish perception verb complements are restricted to stage-level predicates.[11] If the above analysis of PVCs for English is correct, then the following datum suggests that *estar*-predicates, but not *ser*-predicates project AspP.

(21) Vi a Juan en la casa/cansado/*profesor.
I saw A John in the home/tired/*teacher
'I saw John at home/tired/*a teacher'

Consistent with the idea that *estar* predicatives contain AspP but *ser* predicatives don't, Schmitt (1992) has argued independently that *estar* is an aspectual copula but *ser* is non-aspectual. That is, a predicate that occurs with *estar* carries temporal meaning: it relates to the temporal structure or constituency of an eventuality. As Schmitt argues, it denotes a result state. A predicate that occurs with *ser* is atemporal. A clear example of this difference can be seen in (22).[12]

(22) a. Maria é quase bonita.
Maria is almost pretty
'Maria is sort of pretty'

[11] It is not clear whether this is the case in Portuguese, i.e. individual-level predicates are permitted in this context according to the judgment of one speaker of Brazilian Portuguese. At present I do not have an account of this fact.

[12] See also Luján (1981) for a similar argument that the *ser/estar* distinction is an aspectual one.

b. Maria está quase bonita.
Maria is almost pretty
'Maria is not pretty yet'
(Portuguese; from (Schmitt, 1992, p. 422))

In (22b), the adverb *quase* 'almost' modifies an event of becoming pretty, while in (22a), the adverb *quase* modifies the adjective itself. Since grammatical Aspect is something that relates to events, the structure for (22b) contains AspP, while the structure for (22a) does not.

### 3.3 Summary

Thus far I have made the argument that stage-level (or otherwise temporal) predicates project AspP, but individual-level (or otherwise atemporal) predicates do not. The evidence for this syntactic relationship came from English perception verb constructions and existential codas (although the case made from existentials was admittedly weaker), Russian past tense main clause predicatives and Spanish and Portuguese present tense predicatives. English PVCs were argued by Felser to contain AspP as the highest functional projection, and only stage-level predicates are admitted in this environment. Russian past tense predicatives with Instrumental case on the predicate have a temporal interpretation and are argued by Matushansky to contain an AspP. (Past tense predicatives with Nominative case, in contrast, are non-aspectual: they have an atemporal meaning and do not project AspP.)

The alternation between stage- and individual-level predicatives in Spanish and Portuguese is an alternation in the lexical form of the copula: stage-level predicates occur with *estar*, while individual-level predicates occur with *ser*. The evidence for associating *estar*-predicates with AspP is much the same as in adult English: stage-level predicates have a temporal meaning and relate to the internal temporal structure of an eventuality, and thus encode Aspect. Individual-level predicates are atemporal and therefore don't encode Aspect. The main difference in this respect between Spanish or Portuguese and English is that Spanish and Portuguese indicate the aspectual difference in terms of the lexical form of the copula, whereas English does not. In the next section, we will see that child English, like Spanish and Portuguese, displays a difference between stage- and individual-level predicatives in form (overtness vs. omission ) of the copula. It will then be argued that the Aspect-based analysis of the stage-/individual distinction allows us to account for the pattern of copula omission we find in child English.

## 4 Child English

Many of the facts discussed above for Russian, Spanish and Portuguese are well-known and widely discussed in the literature. Previously unknown, however, is the fact that child standard English displays a similar asymmetry between stage- and individual-level predicates in main clause predicatives. Like Spanish and Portuguese, the asymmetry appears as a difference in the form of the copula: in child English, we find a null/overt alternation in stage- vs. individual-level predicatives.

The data presented here come from the spontaneous speech utterances of four English-speaking children, taken from the CHILDES database (MacWhinney and Snow, 1985). In Table 1 I give the ages and average MLU (Mean Length of Utterance) of the children whose data are discussed here.[13] The final column (*Be* Contexts) lists the number of utterances in the relevant files that

[13]Mean Length of Utterance is the average number of morphemes per utterance, measured over the first 100 utterances in a file (Brown, 1973).

either contained an overt copula or lacked a copula (but would require an overt copula in adult English).

Table 1: Children's Ages, MLU and Number of Predicatives

| Child (source) | Age Range | Avg. MLU | *Be* Contexts |
|---|---|---|---|
| Nina (Suppes, 1973) | 2;0-2;2 | 2.98 | 471 |
| Peter (Bloom, 1970) | 2;0-2;3 | 2.84 | 785 |
| Naomi (Sachs, 1983) | 2;0-2;7 | 3.09 | 555 |
| Adam (Brown, 1973) | 2;7-3;4 | 3.38 | 792 |

All four of the children in this study are at a stage of development in which they omit functional elements in some, but not all of their utterances. For example, they sometimes omit determiners, verbal inflectional morphology and auxiliary verbs in addition to the copula. Nevertheless, when these functional elements are used they are virtually error-free, and the copula is (correctly) inflected (e.g. *is*, *am*, etc., not *be*) 99.25% of the time. The files were chosen on the basis of the children's production of predicatives and of the copula: the earliest file selected for each child was the earliest at which the child used all types of predicatives, and the last file selected was the last one in which the child's rate of omitted *be* was significantly different in locative and nominal predicatives. The reason for using this criterion for choosing the last file for inclusion in the analysis will become clear when we look at children's asymmetric rates of omission of the copula.

First, let us examine children's omission of the copula in nominal and locative predicatives; we will return to adjectival predicatives in section 6.

As shown in Table 2, children showed a strong tendency to use an overt (inflected) copula in nominal predicatives but to omit the copula in locative predicatives.[14]

Table 2: Average Rate of Overt *Be* in Children's Predicatives

| Child | Nominal Pred. | | Locative Pred. | |
|---|---|---|---|---|
| Nina | 74.1% | (143) | 14% | (115) |
| Peter | 81.2% | (401) | 26.7% | (90) |
| Naomi | 89.7% | (102) | 38.1% | (31) |
| Adam | 44.4% | (303) | 4.9% | (26) |
| avg. | **72.4%** | | **20.9%** | |

Adam's rates of overt *be* are noticeably lower than those of the other children, but his rates are lower in both categories. That is, he shows the same trend as the other children, but his rates of an overt copula are depressed overall. For comparison, the average rates of overt *be* excluding Adam's data are 81.7% for nominal predicatives and 26.3% for locative predicatives. Some examples of children's nominal and locative predicatives are given in (23) and (24) (the child's age at the time of utterance is given in years;months(.days)).

[14]In the table, the numbers in parentheses to the right of the percentages indicate the total number (N) of copular utterances of each type. That is, Nina produced 143 nominal predicatives, 74.1% of which contained an overt copula.

(23) a. I'm big boy. (Adam 2;7)
b. he's a dog. (Nina 2;0.24)
c. Patsy's a girl. (Peter 2;1.22)
d. she's a crocodile. (Naomi 2;3)

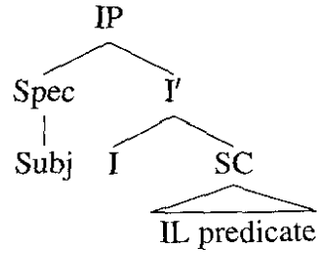
(24) a. my pen down there. (Peter 2;0.10)
b. I in the kitchen. (Nina 2;1.15)
c. Eric at Cathy house. (Naomi 2;4.30)
d. he way up dere [there]. (Adam 3;0.10)

It is interesting to note that the nominal predicates children use denote exclusively permanent properties (often an object's name or label), and their locative predicates denote exclusively temporary locations. Thus, while there may be predicates that do not possess the canonical properties of stage- or individual-level predicates (NP predicates that denote temporary properties, e.g. *fugitive*, and locative predicates that denote permanent locations, e.g. *Paris is in France*), children do not produce such predicates at this stage of development. The question of how these non-canonical predicates are analyzed in child English is an important one. Acknowledging that the correct analysis of these predicates in *adult* English is still not completely settled, it is an issue that I plan to pursue in future experimental work.

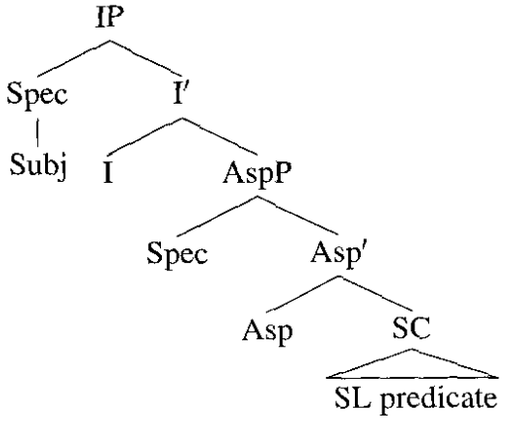
## 5 Analysis

To recapitulate briefly, the structure proposed for individual-level predicatives is that in (25a), and the structure proposed for stage-level predicatives is that in (25b).

(25) a.




b.




We saw in the previous section that children acquiring English omit the copula when AspP is projected in the structure, and they produce an overt (and inflected) copula when AspP is not projected. This result may seem surprising, a priori, since children appear to be adding something to the string when there is less structure, but leaving something out of the string

when there is more structure. So we should ask how it is that the syntactic asymmetry between stage- and individual-level predicates, argued for in sections 2 and 3, helps us account for the asymmetry in the overtness of the copula in child English. Put another way, why does AspP "block" the occurrence of an overt copula? To see how it does so, let us turn to the temporal anchoring of main clauses.

Let us assume that all main clauses must be anchored to the discourse in order to receive a temporal interpretation, and this is done via an abstract Tense Operator ($T_{OP}$) located in the C-domain.[15] Let us further suppose that all indicative main clauses must be anchored by this operator. Temporal anchoring obtains when $T_{OP}$ binds a functional head in the matrix clause that is associated with the temporal structure of the clause. The functional heads associated with temporal structure are Infl and Asp.[16] The particular head that must be bound is determined by the particular grammar and may vary across languages, in a way to be made explicit directly.

Let us define temporal anchoring in the following way.

(26) *Definition*
Temporal Anchoring:

i. A main clause is temporally anchored if the Tense Operator ($T_{OP}$) binds an appropriate functional head in the structure, where an appropriate head is either Infl or Asp.

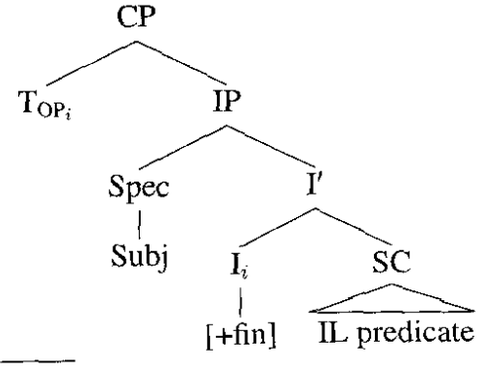
ii. In some languages $T_{OP}$ binds only Infl; in other languages it binds Asp (when projected).

Further, let us define grammatical finiteness in terms of temporal anchoring, so that a main clause is finite when $T_{OP}$ binds Infl, but not otherwise. In other words, Infl is the sort of head that, if bound by $T_{OP}$, results in morphosyntactic finiteness (provided the particular language contains morphology to express finiteness). Asp is not the sort of head that bears finiteness features, so a clause in which $T_{OP}$ binds Asp is not finite (nor is it infinitive: $Asp^0$ simply does not relate to grammatical finiteness).

In adult English, all indicative main clauses are finite (the main verb or auxiliary element, if present, carries tense or agreement features, which may or may not be realized overtly). Therefore, in adult English $T_{OP}$ always binds Infl, whether or not AspP is projected in the structure.

Thus, the structures of individual- and stage-level predicatives in adult English are then those in (27a) and (27b), respectively.

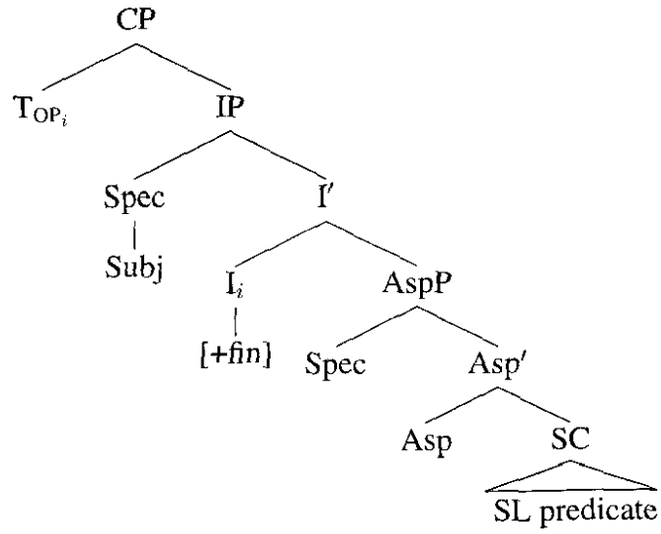
(27) a.




[15]Enç (1987) and Guéron and Hoekstra (1995) have both proposed such an operator; for Enç the operator is in the head, $C^0$, while for Guéron and Hoekstra it is in SpecCP. I remain neutral on the issue of its precise location within the CP projection.

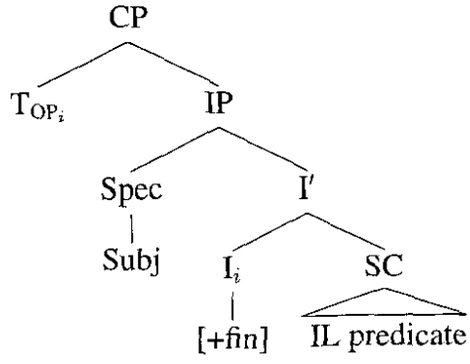
[16]I do not distinguish between the heads Infl and Tns.

b.

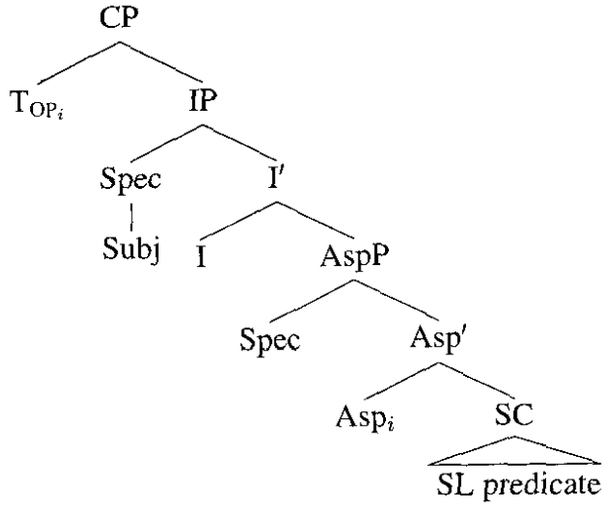



But in grammars in which the temporal anchoring requirement is satisfied through the binding of $Asp^0$ (when projected), not all main clauses will be finite. In particular, stage-level predicatives involve a bound Asp instead of a bound Infl, and these expressions are not finite. I argue here that child English is a grammar in which $Asp^0$ is bound by $T_{OP}$ when Asp is projected. Thus, the structures for individual- and stage-level predicatives in child English are given in (28a-b).

(28) a.




b.




I should point out here that Infl in (28b) does not have a [–fin] feature, rather it is just empty. In spite of its being empty, we still want to project IP (as opposed to projecting only as far as AspP; e.g. one might propose this if one believes children's clause structures are reduced—see Rizzi (1994)). IP must be projected even when Infl is not finite, because some of children's null-copula predicatives contain Nominative subjects (e.g. *I in the kitchen*). In such cases we would

need to have a position for the subject to move to which is high enough to get Nominative case. I assume that the canonical subject position is the appropriate position. (See also arguments in Schütze (1997) for the view that IP must be projected in children's main clauses.)

The difference between child and adult English, then, amounts to a difference in the way in which the temporal anchoring requirement is satisfied. In adult English it is satisfied through the binding of Infl, regardless of whether Asp is projected in the structure or not. In child English it is satisfied through the binding of Infl only if Asp is *not* projected (i.e. in individual-level predicatives) (otherwise, the requirement is satisfied through the binding of Asp). Recall the claim made above that main clauses in which Infl is bound by $T_{OP}$ are finite, while clauses in which Infl is not bound (i.e. those in which Asp is bound) are non-finite. In predicative constructions, finiteness is expressed via an inflected copula, and non-finiteness is indicated by the absence of an inflected copula. By defining finiteness in this way, we capture the association in child English between the projection of Asp and a null copula, and between the lack of Asp and an overt, inflected copula.

## 6 Adjectival Predicatives

Although the asymmetry in copula omission between nominal and locative predicatives is robust and clear, it is somewhat less robust among individual-level and stage-level adjectival predicatives. Nevertheless, three of the four children do show an asymmetry in the expected direction (a higher rate of overt *be* with individual- than stage-level adjectival predicates), and I will argue that adjectives introduce independent difficulties.

In Table 3 I give the children's average rate of overt *be* in adjectival predicatives.

Table 3: Average Rate of Overt *Be* in Children's Adjectival Predicatives

| Child | IL Adjectives | | SL Adjectives | |
|---|---|---|---|---|
| Nina | 75.3% | (24) | 49.5% | (38) |
| Peter | 60% | (29) | 39.8% | (87) |
| Naomi | 93.5% | (29) | 52% | (64) |
| Adam | 44.4% | (35) | 43.3% | (80) |
| Avg. | **68.3%** | | **46.2%** | |

Some examples of children's adjectival predicatives are given in (29).

(29) a. this empty. (Peter 2;3.3)
b. this is orange. (Peter 2;3.3)
c. her thirsty. (Nina 2;2.6)
d. Mommy's little. (Nina 2;1.22)
e. you warm enough. (Naomi 2;5)
f. and this is yellow. (Naomi 2;5)

Once again, Adam's utterances pattern somewhat differently from those of the other children in that he does not show a difference in his rate of overt *be* between stage- and individual-level adjectives. In fact, Adam's rate of overt *be* in adjectival predicatives is the same as his rate of overt

*be* in nominal predicatives, suggesting that if there is a syntactic reason behind children's omitted copulas, Adam's grammar assigns the same (in relevant respects) structure to both adjectival and nominal predicatives, but a different one to locatives. According to the present analysis this would entail that Adam's adjectival predicates uniformly lack AspP. However, given Adam's overall low rate of overt *be*, I hesitate to take a strong position on this particular issue. For comparison, the average rates of overt *be* in adjectival predicatives excluding Adam are 76.2% and 47.1%. The reasons for Adam's different rate of omitting the copula is not totally clear, but it is possible that Adam was exposed somewhat to African American English, in which null copula main clauses are grammatical, and perhaps this had an effect on his tendency to omit the copula.

The overall weaker distinction between stage- and individual-level predicates in terms of children's copula omission may seem surprising if children indeed have grammatical knowledge of the stage/individual distinction. However, there are a number of factors concerning adjectives that suggest that adjectives are not straightforwardly classified as stage- or individual-level, and therefore that they might not pattern exactly like nominal and locative predicates.

There are certain adjectives that behave in some respects like stage-level predicates and in other respects like individual-level predicates. For example, as discussed by Jäger (1999), *available* denotes a temporary property, it can be modified by temporal modifiers (e.g. *John is available on Tuesdays*), its bare plural subject can get a weak reading (e.g. *Firemen are available*: existential OK) and it can occur in an existential coda (*There are firemen available*), but it cannot occur in a PVC (**I saw John available*). There are also a number of adjectives that are individual-level in the unmarked case (e.g. *John is mean*), but which can be easily coerced into a stage-level meaning in different syntactic contexts. For example, these adjectives occur in the "active *be*" context (*John is being mean*) and in Stowell's (Stowell, 1991) "mental property" contexts (*John was mean to hit Bill/It was mean of John to hit Bill*) (please see Fernald (2000) for a discussion of coercion).

Moreover, since adjectives constitute a single lexical category, children cannot classify adjectives as stage- or individual-level simply on the basis of their lexical category, as they might, for example, with NP and PP predicates. Rather, the stage- or individual-levelhood of each adjective must be learned on an item-by-item basis. For this reason, and because of the existence of discrepancies between the temporary/permanent meaning of an adjective and its behavior in the stage/individual tests, I conclude that children's somewhat weaker stage/individual distinction in terms of their omission of the copula with adjectival predicates does not constitute counterevidence to the general pattern. Therefore, I maintain the generalization that children tend to produce an overt copula with individual-level predicates, and they tend to omit the copula with stage-level predicates.

## 7 Hebrew

According to the present analysis, the omission of the copula in child English predicatives results from the fact that $T_{OP}$ binds $Asp^0$ to satisfy the temporal anchoring. If this option is made available by UG and if child grammars are subject to the full range of UG principles that govern adult grammars (i.e. if this is not a property only of "pre-mature", or non-adult grammars), then we would predict that there are adult grammars that display the same pattern of copula omission in main clauses as we find in child English. Here I would like to suggest that adult Hebrew is such a language.

In Hebrew present tense predicatives the copula is not verbal, unlike its past and future tense counterpart (*h.y.y*) (Doron, 1983; Rapoport, 1987; Rothstein, 1987; Greenberg, 1994; Rothstein,

1995, among others). Rather, it is the spellout of Agreement material in Infl (Rapoport, 1987). Also unlike the past and future tense verbal copula, the "pronominal" copula, or Pron (*hu* in masculine singular), is omitted in some predicatives but overt in others (the verbal copula in past and future tenses is obligatorily overt in all main clause predicatives).

Some examples are given in (30) (from Greenberg, 1994)).

(30) a. ha-kli ha-ze *(hu) patiS
the-tool the-this 3m.sg hammer
"This tool is a hammer."

b. Dani (*hu) me'od 'ayef ha-yom
Dani 3m.sg very tired the-day
"Dani is very tired today."

c. ha-Samyim (hem) kxulim
the-sky 3m.pl blue
"The sky is blue."

The predicate in (30a) denotes an inherent, indeed, definitional property of the subject, and Pron must be overt. The predicate in (30b) denotes a temporary, non-inherent property, and Pron must be null. In (30c), Pron is optionally overt, but its overtness/covertness corresponds to a difference in the meaning of the predicate. When Pron is overt the sentence means "The sky is blue (as opposed to some other color, e.g. red)"; when Pron is null the sentence means "The sky is blue (right now, as opposed to being overcast)".

Greenberg (1994) shows that in predicatives with an overt pronominal copula the predicate denotes an inherent or generic property (e.g. *orvim *(hem) Sxorim* 'Ravens are black'), while in predicatives with a null copula the predicate denotes a non-inherent or non-definitional property. Thus, Hebrew appears to divide predicates into temporal and atemporal properties along somewhat different lines than a language like adult English. For example, the predicate *more* 'teacher' could be temporal or atemporal in Hebrew, but it is only atemporal (individual-level) in English. Nevertheless, the syntactic result that temporal predicates project AspP and atemporal predicates do not project AspP is the same in both languages. Moreover, the morphological reflex of this asymmetry is the same in Hebrew as in child English: in Hebrew, predicates that denote non-inherent properties project AspP, and in these cases $Asp^0$ is bound by $T_{OP}$, hence there is no overt copula. Predicates that denote inherent properties do not project AspP; in these cases the only head available for binding by $T_{OP}$ is Infl. When Infl is bound it is spelled out as the pronominal copula.

## 8 Summary and Open Questions

The main argument made in this paper is that the semantic contrast we know as the stage-level/individual-level distinction corresponds to a syntactic (aspectual) difference between predicative structures. Stage-level and otherwise temporal predicates project AspP above the lexical Small Clause. Individual-level and otherwise atemporal predicates do not project AspP. Support for the association between stage-level predicates and AspP (and between individual-level predicates and the lack of AspP) was provided from English perception verb complements and existential codas (which admit only stage-level predicates and arguably contain AspP), Russian

past tense predicatives (Instrumental case-marked predicates have a temporal meaning, and Instrumental is checked in SpecAspP) and Spanish and Portuguese main clause (present tense) predicatives (the *ser/estar* distinction was argued to be an aspectual one).

The analysis of the stage/individual contrast as a syntactic aspectual distinction provides a basis for accounting for the asymmetry in the overtness of the copula in child English. As shown in section 4, children acquiring English tend to omit the copula with stage-level predicates but use an overt, inflected copula with individual-level predicates, a pattern seen most clearly in nominal and locative predicatives. The formal requirement of temporal anchoring defined in section 5 allows us to capture this null-/overt-copula alternation. Stage-level predicates contain AspP, and in child English $Asp^0$ can be bound by $T_{OP}$ to satisfy the temporal anchoring requirement. Main clauses containing these predicates are non-finite in child English (realized as a null copula) because Infl is not bound by $T_{OP}$, rather, it is Asp that is bound. Individual-level predicates, instead, lack AspP, so the only functional head available for binding by $T_{OP}$ is Infl. When Infl is bound, the clause is finite, and in (non-verbal) predicatives finiteness is spelled out as an inflected copula. Adult English, in contrast to child English, never allows $Asp^0$ to satisfy the temporal anchoring requirement, and so in all main clauses in adult English, Infl is bound by $T_{OP}$, and the copula is overt and inflected.

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# Presenting and Predicating Lower Events*

## Abstract

The effects of different forms of predication have been insightfully (and almost exclusively) studied for 'simple' cases of predication, of which the 'presentational sentence' is maybe the paradigm instantiation. It is the aim of this paper to show that the same kind of effects as well as in fact the same kind of structures are present at embedded levels in thematically and otherwise more complex structures. Beyond presentational sentences, 'unaccusative' experiencing constructions involving a dative subject, 'double object constructions' and – to a lesser extent – spray/load constructions are discussed. For all of these, it is argued that they comprise a predication encoding the ascription of a transient temporal property to a location. On this basis, a proposal is made as to how the scope asymmetry between the two arguments involved in the constructions can be explained. Furthermore, a proposal is made as to how what has been called 'argument shift' is motivated.

## 1 Introduction

In this section, the constructions under investigation are briefly introduced (1.1). Subsection 1.2 comprises the proposal and gives an overview of the discussion. Some background assumptions the proposal depends on are spelled out in 1.3.

### 1.1 Constructions

The constructions to be dealt with are exemplified in (1) to (4). Since the bulk of data to be discussed comes from German, I give an example in German verb-final order under (a). (b) roughly indicates the assumed structure:

(1) Presentational Construction (PC): 'There {was, appeared} a man (in the garden)'
   a. Da ein Mann (im Garten) {war, erschien}
   b. [There [[DP$_{man-NOM}$ (PP$_{garden}$)] was/appeared]]

(2) Dative Experiencer Construction (DEC): 'A gangster escaped the police'
   a. Der Polizei ein Gangster entkam
   b. [ DP$_{police-DAT}$ [DP$_{gangster-NOM}$ escaped]]

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(3) Double Object Construction(DOC): 'Otto sold a man a gun'
   a. Otto einem Mann eine Pistole verkaufte
   b. [DP$_{otto-NOM}$ [DP$_{man-DAT}$ [DP$_{gun-ACC}$ sold]]]

(4) Shifted Spray/Load Construction (shifted S/LC): 'Otto loaded a cart with hay'
   a. Otto einen Wagen mit Heu belud
   b. [DP$_{otto-NOM}$ [DP $_{cart-ACC}$ [PP$_{hay}$ loaded]]]

For ease of reference, I call the elements underlined 'shifted arguments'. This is however not to suggest that they have undergone movement. A detailed discussion of the (common) syntactic properties of these constructions is not the subject of this paper but can be found in Brandt (in progress). In what follows, reference will be made also to what I call here the 'oblique object construction' and the 'unshifted spray/load construction', exemplified in (5) and (6):

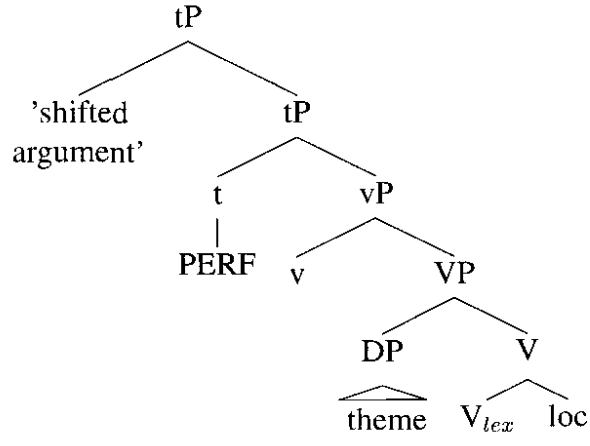
(5) Oblique Object Construction (OOC): 'Otto sold a gun to a man'
   a. Otto eine Pistole an einen Mann verkaufte
   b. [DP$_{otto-NOM}$ [DP$_{gun-ACC}$ [PP$_{man}$ sold]]]]

(6) Unshifted Spray/Load Construction (unshifted S/LC): 'Otto loaded hay onto a cart'
   a. Otto Heu auf einen Wagen lud
   b. [DP$_{otto-NOM}$ [DP$_{hay-ACC}$ [PP$_{wagon}$ loaded]]]

### 1.2 Proposal and Overview

The 'shifted arguments' restrict a spatiotemporal location that is ascribed a temporal property. This property is a change of state associated with the occurrence of an event. In rough syntactic terms, the claim is that (1) – (4) share as part of their overall structure a structure as depicted in (7) that encodes this meaning:

(7)




Spelling this out in more detail, the paper seeks to derive in particular:

(A) The fact that a D/NP in the c-command domain of the 'shifted argument' is confined to a narrow scope interpretation

(B) The reason behind what has been called 'argument shift'

After laying down more global background assumptions, the view here on presentational *there* sentences is sketched and motivated to some extent: Presentational *there* sentences are viewed as encoding the ascription of a transient temporal property to a location (section 2). Section 3 presents evidence in favor of the claim that the shifted ditransitive constructions under discussion are biclausal. However, the lower clause is argued to comprise an event, the predication it encodes thus being different from a primitive possessive relation HAVE. Building on Freeze (1992), section 4 argues for the shifted ditransitive constructions that the possession-like relation between the shifted argument and the theme argument really stems from the lower clause's corresponding to a presentational sentence. Collecting (the relevant parts of) the constructions into one, section 5 analyzes the building blocks of the predication in question and how they are put together, deriving (A) and (B) above:

As to the 'scope freezing' property associated with the construction, it is argued that a D/NP that finds itself in the c-command domain of the shifted argument codefines the property that is ascribed to the shifted argument. It is in this sense 'incorporated' into the predicate, which forces it to take narrow scope.

As to the motivation for 'argument shift', it is argued that the D/NP (including *there*) that finds itself in the position of the shifted argument acts as the logical subject of the predication encoded, restricting what is being quantified over. Not filling this position with an appropriate argument would leave the restriction too small for the predicate to be assessed, resulting in a semantically ill-formed structure.

Section 6 sums up the results and aims them back at presentational sentences that do not seem to fit the picture.

## 1.3 Core background assumptions

### 1.3.1 Lexicon/Syntax

The general view of 'narrow' syntax adopted here is this: Syntactic structures are not deterministically projected form contentful lexical categories (idiosyncratic sound/meaning associations). Rather, (arrays of) functional categories selecting these lexical categories to a large extent determine the eventually projected syntactic structures and – as a consequence – how they are interpreted.[1] An example is the assumption made here of a category 'light verb' labelled 'v' that selects VP as projected by the lexical verb. For example, selection of (an instance of) 'little v' determines whether an agent argument is projected or not. As far as I can see, two conjectures crucial here are natural on, if not essential to, this view: First, 'poorer' structures (where for example an agent argument is not projected) correspond to parts of full blown structures with higher layers missing (rather than being derived from these full blown structures). Second, since syntactic structures (LFs) feed interpretation, not all meaning is associated with contentful lexical categories.

### 1.3.2 Spatiotemporal Location, states and events

Following Galton (1984), I assume that states are logically distinct from events in the following way: States correspond to sets of times, namely those times where they are true. A proposition encoding a state can therefore be evaluated with respect to just a time. Events 'take time': A proposition encoding an event can be evaluated only given an event AND a particular time:

[1] This view seems particularly prominent in recent work by Borer, Marantz and Cinque among others and is sometimes called 'neoconstructional'.

It will be true if the event occurred in that time and false otherwise. To cite a passage from Galton (1998): "With an event, the natural question is *When did it happen?*, answered by means of the function which maps event occurrences onto times, whereas with a fluent [≈ states and progressives], the natural question is *What is its value at time t?*". Events as well as times are both primitive, then, with each event being associated with a certain time in the temporal framework.

For the representation of time, I assume the following: The type T of times has the structure of an algebra, comprising atomic times and sums built from these atomic times, where these sums are again individuals 't'. The Time Structure will be ordered with respect to (at least) inclusion ('$\leq$') as well as precedence ('$\prec$').[2] The crucial assumption pertaining to the state/event distinction is that states can be evaluated with respect to an atomic time (≈ instant). The occurrence of an event can be assessed only given a 'sum individual' time (≈ interval).

Times are understood to 'locate' states in that they are the things that have states as properties. I use times for representation, but will speak in the text of 'spacetimes' or 'locations' rather. While all these concepts seem equally mysterious eventually, times seem to me to have the advantage of having a richer tradition in Linguistics with theories for representation in place.

### 1.3.3 Events, perfection and target states

Events are essentially determined by the change of state that is associated with them: We believe that something must have happened if something has changed. With Dowty (1979) and Kratzer (1994), I assume that the meaning of an eventive predicate (Vendler (1957)'s accomplishments/achievements) derives from the state that the event 'brings about': Events have as properties the states that result from them. For example, an accomplished event of *feeding the cat* has as a consequence a state where *the cat is fed.* This is captured by Kratzer's 'f-target' function that takes an event argument and maps it onto its 'target state':

(8) FEED THE CAT $\rightsquigarrow \lambda e\ \lambda t$ [feeding(e) & (fed(the cat))(f-target(e)) (t)]

For the meaning of the target state (the set of times at which it holds) to be determined, the event leading to it has to have happened or be 'perfected'. The occurrence of an event is represented by binding the event argument, where this binding is accomplished by a perfect operator which is assumed to be situated in the extended verbal projection (cf. (7)). Apart from existentially quantifying the event variable, the perfect operator does something else: It maps the times that make the target state true to a set of 'bigger' times which comprise as parts at least one time where the target state holds and at least one (preceding) time where the target state does not (yet) hold. What the perfect operator does then is capture the event, understood essentially as a change of state occurring over time, 'as a whole'. The denotation of the perfect operator is given in (9), its application to what we have above in (8) is given in (10):

(9) PERFECT $\rightsquigarrow \lambda P\ \lambda t\ \exists t_1, t_2, e$ [$\neg$P(f-target(e)) ($t_1$) & P(f-target(e)) ($t_2$) & $t_1, t_2 \leq t$ & $t_1 \prec t_2$]

(10) PERFECT(FEED THE CAT) $\rightsquigarrow \lambda t\ \exists t_1, t_2, e$ [feeding(e) & $\neg$ (fed(the cat))(f-target(e)) ($t_1$) & (fed(the cat))(f-target(e)) ($t_2$) & $t_1, t_2 \leq t$ & $t_1 \prec t_2$]

[2] The Time Structure T can be represented thus: $T = \langle U_T, \oplus, \leq, \prec \rangle$. The sum operation '$\oplus$' is an idempotent, commutative and associative function from $U_T \times U_T$ to $U_T$. Cf. Link (1983), Krifka (1998) for definitions of part structures for the modelling of Mass Nouns/Plurals and the spatiotemporal domain respectively.

### 1.3.4 Predication

Predication is asymmetric: Subject expressions are capable of referring and 'standing on their own'. Predicate expressions are essentially incomplete and dependent (Strawson, 1959, chap. 5 & 6).

In Semantic Theory, this asymmetry is expressed in terms of quantification. In first order predicate logic, individual variables are the only terms that lend themselves to quantification. In second order generalized quantifier theory, predication is expressed as an asymmetric relation between sets. Following tradition, I assume that predication proper entails a subject-predicate relation as well as what one might call 'temporal location' (Aristotle: De Interpretatione, §§ 2, 3, 5).

The paradigm syntactic unit encoding predication in this sense is the clause. In (generative) Syntactic Theory, the 'Extended Projection Principle' states that 'Sentences must have syntactic Subjects' (Chomsky (1981), Rothstein (1983)) and it is assumed that the structural relation between subjects and predicates is asymmetric in that a subject must c-command its predicate (Williams (1980)).

## 2 Presentational Sentences

This section draws together some points suggesting that presentational sentences can be viewed as encoding the ascription of a transient state to a location denoted by *there*. It is proposed that the 'scope freezing' property of *there* is rooted in this.

### 2.1 Presentation and Location

The intuition that presentational sentences are locative in some sense is unsurprising. Across languages, an element similar to English *there* appears both as what is commonly taken to be a meaningless 'dummy' subject expression and as a locative proform. In general, a speaker will be the more ready to utter a presentational sentence the more specifically 'located' the concept that is asserted to be instantiated is. Thus (a) does not make a good presentational sentence, but (b) does:

(11) a. ??There is life
b. There is life {on Mars, after marriage}

Presentational sentences are used to 'single out' certain states of affairs, they point to something that 'is the case'. While *life* alone does not seem to make an interesting case, *life on mars* or *life after marriage* does. Inspired by Chierchia (1995), McNally (1998b) argues specifically that 'location dependence' is the crucial property a state must have to be encodable in a presentational sentence. What is ruled out are states that are 'location independent' ($\approx$ Carlson's (1978) indidual level predication), where in essence "the entities participating in these states will do so no matter what their location happens to be" (McNally, 1998b, p. 298). Thus *there is a man bald* does not make a good presentational sentence while *there is water available* does. Location does not matter for a man's baldness, but it does matter for the availability of water.

## 2.2 Predication in Presentational Sentences

An alternative to the view that presentational sentences lack a logical subject (and hence that *there* as it appears as subject in presentational sentences is a 'dummy' expression) is expressed for example in Kratzer (1994), of which I cite a passage:

(I) The White Mountains are visible

... is most easily understood as answering a question about a contextually salient spatiotemporal location: As for the time and place we are considering, what is going on there? (I) says that what is going on there is that the white mountains are visible. [Kratzer 1994: 65f]

In effect, what Kratzer proposes is that (I) really expresses the ascription of a property – the holding of a particular situation – to a location, which is consequently the subject of the predication. Kratzer argues that the LF of (I) comprises a 'raising copula' predicating a situation of a spatiotemporal pronoun corresponding to *there* but phonologically invisible. *The white mountains* raises past the copula and the invisible *there* and becomes the syntactic subject of (I). The logical subject of the presentational sentence is however the location denoted by (unpronounced) *there*.

The 'scrambling language' German provides evidence suggesting that what appears as the surface subject of (I) plausibly generates lower structurally than a locative proform. In German, the proform *da*, largely corresponding to English *there*, has to appear to the left of – and c-commanding on standard assumptions – stranded quantifiers associated with the extracted phrase. Similarly, '*was fuer* split' leaves behind the NP restriction to the right of (and c-commanded by) this proform.[3]

(12) a. [Weisse Berge]$_i$ waren **da** viele$_i$ sichtbar.
[White mountains]$_i$ were **there** many$_i$ visible.
b. *[Weisse Berge]$_i$ waren viele$_i$ **da** sichtbar.
[White mountains]$_i$ were many$_i$ **there** visible.

(13) a. Was$_i$ waren **da** [fuer Berge]$_i$ sichtbar ?
What$_i$ were **there** [for mountains]$_i$ visible ?
b. *Was$_i$ waren [fuer Berge]$_i$ **da** sichtbar ?
What$_i$ were [for mountains]$_i$ **there** visible ?

In the spirit of Kratzer (1994), Kiss (1996) puts forward evidence that "There constructions always predicate about a specific point in space and time: about *here and now* or *there and then*". If *there* is the logical subject in a presentational sentence, then it is expected to behave like a definite or 'strong' D/NP in principle, where I assume that the crucial property of a strong D/NP is that it carries an existence presupposition (while a weak D/NP does not).[4] Evidence for *there* corresponding to a strong D/NP comes from patterns involving tag formation. While tag formation is bad with predicates that involve weak subjects, it is good with predicates involving strong subjects as well as with presentational *there* constructions:[5]

[3]Stranded quantifiers have been argued to mark the base position of the extracted NP complement (cf. Sportiche (1988)). den Besten (1989) has argued that *was fuer* split can take place only from deep objects before these undergo movement.

[4]Kiss uses the terms 'non-specific' versus 'specific', but I will use the terminology of Milsark (1977).

[5]Presumably, one would want to argue that the anaphor that is part of the tag needs an antecedent the existence of which is established in the common ground.

(14) a. ?*A girl appeared, didn't she/one ? [weak subject]
b. A girl knew the answer, didn't she/one ? [strong subject]
c. There was a man at the door, wasn't there ? [→ strong subject]

Another piece of evidence involves focussing adverbs which do not allow in their scope strong subjects. While these can appear to the left of and have in their scope clauses involving weak subjects, they cannot appear to the left of and have in their scope clauses involving strong subjects. *There* constructions again pattern with clauses involving strong subjects:[6]

(15) a. [Only [A BABY WAS BORN]]; nothing else happened. [weak subject]
b. *[Only [JOHN READ A NOVEL]]; nothing else happened [strong subject]
c. *[Only [THERE WAS AN ACCIDENT]]; nothing else happened [→ strong subject]

Taking *there* to be a locative subject expression locating a state opens a perspective on a range of notorious problems with presentational *there* sentences, such as possible disagreement between the copula and the alleged associate as in: *There's lots of cookies in the box.*[7] Agreement in presentational *there* sentences varies across languages. Thus in e.g. Finnish or French, the copula is always third person singular, no matter what its alleged associate. In the Bantu language Ndendeule, agreement in presentational sentences seems to be with the location (cf. 4.3.1). The absence of existential import in sentences such as *There are steps missing in that proof* (Chomsky, 1999, p. 20)) could be rather straightforwardly accounted for presumably if *there be* – assumed to do the work of a quantifier essentially – is not associated with an NP (here: *a book*), but rather with an entire (set of) state(s). Similarly, the oddity of *??space is in the fridge* as opposed to *there is space in the fridge* (cf. McNally1998b, p. 299) could be blamed on the essential lack of content of the concept associated with *space*, making it unsuitable as a (broadly speaking) topical expression (cf. 5.3).

I will assume here that *there* is locative and that it corresponds to the logical subject in presentational sentences.[8] As to the nature of the predicate in presentational sentences, let us put down for the time being that it corresponds to a state that is location (time-) dependent – we return to the matter toward the end of the paper.

*There* does not 'add' to meaning to the extent that *whatever 'is' is somewhere*. That *there* makes a difference to truth conditions shows in a pattern concerning scope, to which we turn.

## 2.3 Scope in Presentational Sentences

To capture the fact that in presentational sentences D/NPs cannot be 'quantifier raised' across *there*, Williams (1984) has proposed that *there* acts as a 'scope marker'. For example, while in (16a) *someone* can take scope over the modal *must*, this seems impossible in (16b) where it is in the syntactic scope of *there*, cf. also Heim (1987, p. 24). 'x > y' should be read as 'x has scope over y':

[6]For lack of better terminology, the units comprising weak and strong subjects are both dubbed 'clause' here. The unit associated with a weak subject should really be understood as meaning 'clause - X', where 'X' stands in for syntactic material relating to temporality.

[7]Breivik (1997) suggests that *there's* here means something like *I could mention* or *Let me recall*, which take propositional complements.

[8]Bolinger (1977, p. 91) states: "Whether there$_2$ [existential *there*] is meaningless enough to force a distinction [from locative *there*] depends on one's sense of proportion". Kayne (class lectures) argues that *there* is always part of a larger structure comprising a silent demonstrative as well as an abstract noun like PLACE, THING or PERSON.

(16) a. A man must be in the house [must > a man, a man > must]
b. There must be a man in the house [only: must > a man]

This was unproblematic in principle under the assumption of a level of 'deep structure' and a mechanism of 'late insertion'. Under the 'minimalist' (Chomsky (1986) and later) analysis according to which *there* is replaced at LF by its associate D/NP, the phenomenon remains mysterious. Here, the assumption is that the two sentences have identical LFs and that only their phonological form differs.

The 'scope freezing' property of presentational *there* sentences is reminiscent of the scopal properties of predications involving individual level predicates (Carlson (1978)). The subjects of these very strongly take wide scope with respect to the D/NPs they c-command:[9]

(17) a. A girl knew every answer (a girl > every answer, very hard: every answer > a girl)
b. A boy loves every girl (a boy > every girl, very hard: every girl > a boy)

To the extent that a distinguishing feature of presentational sentences as well as individual level predications is that of encoding the ascription of a property to an individual, it seems reasonable to assume that predication and 'scope freezing' are related.

## 3 DOCs and shifted S/LCs: An extra predication and its contents

Evidence for an 'extra' predication in DOCs and shifted S/LCs is presented. The view that this predication comprises a primitive relation HAVE is argued against. The predication is argued to comprise an event rather which is 'perfected', that is, a change of state.

### 3.1 Evidence for an extra predication in DOCs and shifted S/LCs

It is assumed here that predication entails a subject-predicate relation as well as 'temporal location'. That full-fledged DOCs and shifted S/L constructions indeed encode two separate predications in this sense is suggested by a range of facts:

#### 3.1.1 Ellipsis, Anaphora, Comparatives

Under the null hypothesis, ellipsis is licensed if what is elided can be recovered through a structurally (LF) identical antecedent. Consider (18), adopted from Den Dikken et al. (1998):

(18) Shall I give you another sausage ? I can't [ XP ⊘ ]. I'm on a diet.

We understand that what is unpronounced here – traditionally, this projection would correspond to the VP – has a meaning close to *have a sausage*. The most straightforward explanation is that the preceding sentence in fact comprises a structure that encodes this meaning.[10]

[9]According to my intuition, a wide scope reading for *every answer* and/or *every girl* in (17) is about as hard to get as a wide scope reading for the universally quantified D/NP in (i), where clearly a CP boundary intervenes between *ein Mann* "a man" and *jede Frau* "every woman":

(i) Ein Mann glaubte [$_{CP}$ dass jede Frau einen Liebhaber haben muesse]
A man believed [$_{CP}$ that every woman a lover have must]

[10]If Hardt (1999) is right in that what we are dealing with in (18) is not ellipsis but involves an empty proform, then this is also a case of anaphora.

Similarly with DOCs and shifted S/LCs, the anaphor *it* can pick up as an antecedent something propositional that is 'smaller' than the predication superficially encoded by the main verb (cf. McCawley (1974)):

(19) a. Max offered Anna his crocodile. But her mother won't allow it. cf.
b. ?Max offered his crocodile to Anna. But her mother won't allow it.

It is not Max's offer that Anna's mother doesn't allow, but rather that Anna *have* or *get* a crocodile. On the null assumption that anaphors need structurally encoded antecedents, this is straightforward if in fact this 'smaller' propositional meaning is encoded in (19a).

Although somewhat subtle, a contrast involving comparative ellipsis is worth mentioning here. Assume that comparative ellipsis involves the construction of a predicate that is structurally (LF) identical to an antecedent predicate, where what is compared is abstracted over. Consider now a) and b):

(20) a. I'll give you more wine
b. I'll give more wine to you

Both constructions have a reading according to which what is compared is the amount of wine involved in an event of giving: *I'll give you more wine than someone else did before.* (20a) however has an additional reading which seems to be absent in (20b). This reading amounts to something like: *I'll give you wine and you will have got more wine as a result than you had before.* Without further assumptions, this is predicted if the DOC in (20a) indeed encodes a propositional meaning corresponding to *x having (got) y-much wine (at t)*, in contrast to the OOC in (20b) which does not encode this 'extra' propositional meaning.

### 3.1.2 Temporal Location

McCawley (1974) notes that DOCs allow two temporal adverbs. These may be mutually incompatible:

(21) a. At the meeting yesterday the salesmanager gave Anna Europe next year
b. ??At the meeting yesterday the salesmanager gave Europe to Anna next year

If we assume that it is clauses, i.e. units encoding a propositional meaning that allow for temporal modification, then this is evidence that DOCs correspond to two clauses rather than one.[11]

Cinque (2000) argues that the temporal adverbs *always* and *already* can occur only once in a clause, thus providing a test for the number of clauses one is dealing with. What we find is that in shifted S/L constructions and DOCs, these adverbs can in fact appear twice:[12]

(22) a. Immer hat Schimanski den Kühlschrank immer mit Bier vollgepackt
always has Schimanski the fridge always with beer full-packed

[11] Not all DOCs so easily allow independent temporal modification. Clearly, world knowledge and context play a decisive role here. No matter what the context is, however, 'simple' transitive predicates as well as 'oblique object constructions' do not allow it. It would seem that the possibility to have independent temporal modification relates to a verb's ability to license a clausal complement overtly. However, as also the example with 'give' above shows, this is not a necessary condition for the availability of independent temporal modification.

[12] 'Schimanski' is the name of an inspector in the German crime series 'Tatort'

b. ?*Immer hat Schimanski immer Bier in den Kühlschrank gepackt
always has Schimanski always beer into the fridge packed

(23) Schon hat er ihr schon (wieder) einen Kuss gegeben
Already has he her already (again) a kiss given

Cinque's test supports the claim then that DOCs as well as shifted S/LCs are 'biclausal', encoding two propositional meanings.[13]

### 3.2 Core Contents of the predication

It is an old intuition going back at least to generative semantics that the meaning of *give* predicates in DOCs can be decomposed into something like CAUSE-TO-HAVE. While this is in line with the general idea that DOCs are biclausal, it seems too simple to assume that the lower predication involves something like primitive 'possessive' HAVE. Importantly for the issue at hand, there is reason to believe that the predication we are looking at is of an 'eventive', that is, 'change of state' nature.

#### 3.2.1 Entailments

If predicates entering DOCs were indeed composed out of the primitive relations CAUSE and HAVE, we would expect that the constructions quite generally have this meaning, that is, that they generally carry what Oehrle (1976) has called a 'success entailment' involving the HAVE relation. This is not the case, as some run-of-the-mill examples show:

(24) a. I sent Otto a letter $\neg \rightarrow$ Otto ended up having a letter
b. I threw Otto the ball $\neg \rightarrow$ Otto ended up having the ball

(24a) and (24b) may be felicitously uttered also in circumstances where Otto does not end up having a letter or a ball. For example, the mail might have lost the letter; Otto might have failed to get hold of the ball because he stumbled. It is possible to put the blame on the CAUSE predicate, which amounts to the claim eventually that the CAUSE relation is idiosyncratically dependent on the particular verb entering the construction. This move would however deprive the idea of decomposition of its motivation, which is to capture systematically patterns of entailment. What is entailed by the examples given seems to be just what the sentences *Otto was sent a letter* and *Otto was thrown a ball* express – or maybe, putting more weight on the state following the sending: *Otto has been sent a letter (thrown a ball).*

#### 3.2.2 Event-related Adverbs and Particles

That DOCs and shifted S/LCs encode two events rather than just one is suggested by examples such as the following:

(25) She offered me tenderness through the phone

[13]Interestingly, Cinque notes that clitic climbing, a clausebound process, is generally allowed with raising predicates but cannot take place when – on Cinque's view – the raising predicate selects a dative argument. Cinque's example involves the raising predicate *seem*, but 'blocking effects' related to the presence of dative arguments are more frequent. Ngonyani (1996, p.34) reports that in Ndendeule and Swahili, clitic climbing of the direct object is impossible in what corresponds to the DOC. Cf. Anagnostopoulou to appear, chapter 1 and references there for blocking effects associated with the presence of a dative argument.

(26) Wir betraeufelten den Kuchen ordentlich mit Zuckerguss
We be-dropped the cake properly with sugar-coating

(25) is ambiguous: It can mean that the offer was made via the phone or that the transmission of tenderness was to proceed through the phone. The preferred interpretation of (26) is not that the dropping itself happens in the proper fashion but rather that the cake gets properly sugar-coated.

In this connection, the following is an interesting pattern:

(27) Anna ist eine gute Nachbarin, weil sie...
Anna is a good neighbor, because she...
a. ...einem Nachbarn wieder ein Namensschild an die Tuer gebastelt hat.
...a neighbor again a name-tag at the door tinkered has.
b. ...wieder einem Nachbarn ein Namensschild an die Tuer gebastelt hat.
...again a neighbor a name-tag at the door tinkered has.

The reading we are interested in is the 'restitutive' one – on this reading, (27a) carries a presupposition saying that a particular neighbor 'had' a name tag at her door before (which at some stage has fallen off say). Let us assume following (but oversimplifying) Kamp and Rossdeutscher (1994) and Stechow (1996) that the element *wieder* triggering this presupposition has to have in its scope the event that 'restitutes' that former state. Abstracting away from marked intonation, let us further assume that the scope of *wieder* is just what is encoded in its syntactic scope, that is, in its c-command domain (which in the example is everything to the right of *wieder*).

Now the restitutive reading is available only as long as *wieder* occurs to the right of the shifted argument, as in (27a).[14] If *wieder* appears to the left of the shifted argument as in (27b), only a 'repetitive' reading is available: It is not the first time that Anna tinkered with some neighbor's name tag. Under the assumption that *wieder* has to combine with an event argument before this is 'closed off' by binding, this shows that an event leading to the state in question is bound in between the shifted argument and the arguments it c-commands.

Adjectival passive realizations of DOCs and/or shifted S/LCs are still modifiable by event-related adverbs. On the assumption that adjectival passives correspond in essence to the lower 'causeless' parts of the full-blown structures, this shows that these lower structural parts encode an event (cf. Kratzer (1994) for discussion):[15]

(28) Ewige Liebe ist schnell versprochen
Everlasting love is quickly promised

[14]The same goes for S/LCs: Cf. *Bauer Müller belud einen Wagen wieder mit Heu* ("Farmer Miller loaded a cart again with hay" with a restitutive reading available vs. *Bauer Müller belud wieder einen Wagen mit Heu* ("Farmer Miller loaded again a cart with hay" with only a repetitive reading).

[15]That the relevant predication is in a sense eventive is further supported by so-called 'Nixon-sentences', observed first, to my knowledge, by Oehrle (1976):

(i) a. Nixon gave Mailer a book
b. Nixon gave a book to Mailer

(ii) a. Anna gave Otto a kick
b. ?*Anna gave a kick to Otto

(ia) can be interpreted such that it was *the writing of a book* – an event – that Nixon made possible for Mailer. This interpretation is not available in the OOC in (ib). Similarly, if the theme argument encodes an event, such as a kick or a kiss, only the DOC is possible but not the OOC. Note however that one cannot say *Otto has a kick.*

# 4 Hidden Presentational Sentences in DOCs and shifted S/LCs

Parallels between presentational sentences and the 'extra' predication in DOCs and shifted S/LCs are pointed out. Core properties of the latter constructions follow if this predication is in essence presentational, i.e., comprises a locative subject. The 'scope freezing' property of the constructions is proposed to be rooted in this predication.

## 4.1 Existentials, Possession and Location

It has been argued that DOCs and shifted S/LCs cannot be decomposed satisfactorily into CAUSE and HAVE. Still, there is something true about the intuition that DOCs encode 'possession' in a sense. However, it is more of an accident of Germanic that possession is expressed by means of something like *have*. The crosslinguistically productive pattern seems to be that a copula corresponding to *be* as well as some locative marking (case or a preposition) on the subject of the predication are employed to express possession.[16] Here is an example from Russian, but languages as diverse as Hebrew, Hungarian, Hindi, Finnish, Japanese, Swahili and Yucatec exhibit the same pattern.

(29) U menja byla sestra [Russian]
at 1sg.Gen was sister
'I had a sister'

On the basis of a rich collection of data, Freeze (1992) argues that one and the same structure is employed in sentences involving 'predicate locatives' (DP be PP), 'have' predication (DP+loc be XP) and 'presentational locatives' (there be DP PP), where presentational sentences exhibit the 'underlying' structure.

## 4.2 Parallels between Existentials and DOCs and shifted S/LCs

If the predication we are looking at is of the particular locative nature assumed here for presentational sentences, core properties of these constructions that are otherwise mysterious follow. Let me first give some initial plausibility to the idea that the lower predication in DOCs and shifted S/LCs is in a sense locative and then point out in some more detail parallels between presentational sentences and the predication under investigation in DOCs and S/LCs.

### 4.2.1 'Locativeness' of DECs, DOCs and shifted S/LCs

Constructions encoding a meaning related to perception, especially 'experiencing' constructions in a broad sense such as DECs, regularly bear some locative marking across languages. This is not so strange if perception has to do with location. Similarly, it is hardly an accident that in DOCs the shifted argument crosslinguistically frequently bears what one might loosely call 'locative case' (allative in Finnish, dative in Russian and German, an originally locative preposition in Romance etc.). Shifted S/LCs look quite different, and indeed it is not so clear how their surfax syntax agrees with that of the 'dative' constructions. As concerns their interpretation however, they seem very close. Thus in German, what seems to be the same concept may often

[16] cf. Benveniste (1966), Kayne (1983), Larson (1988), Den Dikken (1995) for expression of the idea that *have* is the phonological spellout of the copula *be* and a locative preposition.

be encoded as a DOC or as a shifted S/LC. For example, the following two sentences are true in the same situations:[17]

(30) a. Ich belud den Wagen mit Heu [shifted S/L]
I PRF-loaded the wagon with hay
b. Ich lud dem Wagen Heu auf [DOC]
I loaded the wagon hay onto

The inseparable prefix *be-* that is productively involved in German in the formation of shifted S/LCs has developed from a locative preposition *bei* ("at"). [18] It is unsurprising that *be-* prefixed verbs and locative complements are in complementary distribution if *be-* prefixes really do the same job semantically as locative complements:

(31) a. Ich lud Heu auf den Wagen
I loaded hay onto the cart
b. Ich belud den Wagen *(auf die Ladeflaeche)
I be-loaded the wagon *(onto the loading-floor)

### 4.3 'There' and the shifted Arguments

It is quite uncontroversial that *there* does not have number, person nor case features (cf. for discussion Chomsky 1995, p. 287ff). That dative arguments tend to be crosslinguistically 'defective' as respects their syntactically relevant features is not news either. [19] It seems sensible to take this as a reflex of their meaning.

#### 4.3.1 Binding/ Control, Agreement

If we assume that the shifted arguments denote a location, it is straightforward why they do not control PRO and/or secondary predicates: Not carrying the right features (number, person), they cannot be identified with the anaphorically dependent empty categories involved:

(32) a. *Mary gave Otto$_i$ a sandwich hungry$_i$
b. *Otto loaded the wagon$_i$ with hay dirty$_i$

[17]Other examples from German which may surface as either a DOC or a shifted S/LC without truthconditional differences are: *jemandem-DAT etwas-ACC an-kleiden* "dress somebody something on" (DOC) / *jemand-ACC mit etwas be-kleiden* "dress someone with something" (shifted S/LC); *jmd-DAT etw-ACC schenken* (DOC)/ *jmd-ACC mit etwas be-schenken* (shifted S/LC) "give something as a present" and following the same pattern: *auf-troepfeln / be-troepfeln*; "drip something onto sth" *auf-dampfen / be-dampfen* "steam sth onto sth"; *zu-denken / be-denken* "equip sb with sth"; *kochen / be-kochen* "cook something for sb" *auf-streichen / be-streichen* "spread sth onto sth"...

[18]Kluge (1989), cf. Maylor (1998) for extensive discussion. Marantz (1993, p. 122f) notes that Chichewa and Chaga employ the same applicative affix *-ir* for benefactive and what he calls 'locative applicative' constructions, which he suggests could be related to the presence of a locative class prefix indicating a locatively classified noun:

(i) Alenje a- ku- luk -ir -a pa- mchenga mikeka
hunters SP- prs- weave -APPL -fv loc- sand mats
'The hunters are weaving the sand with mats'

[19]There is of course parametric variation, cf. ex. (33) below. For discussion cf. McGinnis (1998), Anagnostopoulou (to appear), Maling (1998). For argumentation that dative case in German is lexical/semantic cf. Steinbach and Vogel (1998)

Similarly, something like a locative classification could be the reason why in e.g. Germanic or Romance, the shifted dative arguments do not give rise to agreement: There is no locative agreement in these languages. In several Bantu languages such as e.g. Ndendeule, there is agreement between the shifted argument and the predicate. Note that Ndendeule also has locative agreement in what looks like a presentational sentence (examples from Ngonyani (1996, p. 34, 210)):

(33) a. hokolo a- li- sa- pel -a sa- chokolo hi- tabu
grandpa 1SA- PST- 2OA- give -FV 2- grandchildren 8-book
'grandpa gave the grandchildren books'

b. ku- ki- lisa ku- na li- holo
17- 7- well 17SA- with 5- tortoise
'at the well there is a tortoise'
(SA = subject agreement, numbers = noun classifiers, FV = final vowel)

In (dialects of) Italian, the clitic *ci* largely corresponds to English *there*. Thus we have *Ci vado* ("I go there") and *C' è un huomo nel gardino* ("There is a man in the garden"). Strong evidence for the kinship between datives and *there* comes the following pattern:

(34) a. Spedise una lettera a noi
Sent-3rd-sg a letter to us
b. Ci spedise una lettera
{to-us, ?there} sent-3rd-sg a letter
c. *?Ci spedice a noi
{to-us, there} sent-3rd-sg to us

Crucially, (34b) where we have the locative clitic *ci* but no overt dative D/NP is ambiguous: It can either mean that *he sent a letter there* or that *he sent a letter to us*, where the latter reading seems to be preferred.[20] (34c) shows that the locative clitic *ci* cannot replace the direct object.

### 4.3.2 Interpretation

Presentational sentences are famous for 'definiteness effects'. For the constructions under discussion, asymmetries between the two arguments pertaining to strength are widely attested across languages. There is parametric variation as there is parametric variation concerning definiteness effects in presentational sentences (cf. McNally (1998a) and references there). Some languages carry the asymmetry on their sleeves, such as Persian. Here, in what corresponds to the DOC, the dative is overtly marked with the suffix *-ra* encoding 'referentiality'. The theme may not be marked with *-ra* in the DOC:[21]

(35) a. shah vazir -ra ketab dad
shah minister -RA book gave

[20]Cf. Pinto (1997) who notes highly reminiscent phenomena with postverbal subject constructions in Italian. Interestingly, the only 'dative' interpretation available for *ci* seems to be first person plural. This seems to be related to the essentially deictic character of presentational sentences, cf. also 5.3, 6.2.

[21]The Persian data are from Payne (2000) and have been checked with native speakers from Iran. Other suggestive cases include Russian (where the dative argument is marked with a 'specific indefinite' article (Brandt (2000))) and Akan, which does not allow a definite theme with most 'give' verbs (Osam (1996)). Asymmetries pertaining to the interpretation of 'objects' in ditransitive constructions are discussed in among others Basilico (1998), Beckman (1996), Essegbey (2001), Givón (1984), Lefebvre (1998).

b. ?*shah vazir -ra ketab -ra dad
shah minister -RA book -ra gave
c. ?*shah vazir ketab -ra dad
shah minister book -RA gave
'The shah gave (a/the) the minister (a/the) book'

A test that has been proposed for strong argument positions is the interpretation of bare plurals which receive a generic reading in such a position (Krifka et al. (1995)). The shifted argument in a DEC is interpreted generically:

(36) Laien entgingen die Feinheiten der Darbietung
Lays-DAT missed the intricacies of-the performance

Judgments are more subtle with respect to shifted S/LCs. While this is expected given that we are dealing with predication at an embedded level, Kiss' test from section 2.2 applied to the passive realizations of S/LCs (as well as DOCs) yields the predicted result:

(37) a. Wagons were loaded with bricks, weren't some/they ? cf. unshifted
b. ??Bricks were loaded onto wagons, weren't some/they ?

(38) a. ?*Only [a wagon was loaded with bricks]. Nothing else happened/ was the case cf.
b. Only [bricks were loaded onto a wagon]. Nothing else happened.

The asymmetries pertaining to 'strength' are expected if what we are dealing with in the construction is predication, the ascription of a property to the shifted argument.

### 4.4 Scope in DOCs and shifted S/LCs

Like presentational *there* sentences, DOCs and shifted S/LCs exhibit 'scope freezing' effects (cf. Larson (1988) and Basilico (1998)). While in the 'unshifted' constructions the structurally lower argument easily takes scope over the higher one, in the shifted variants this seems impossible, cf.:

(39) a. The teacher assigned a student every exercise
b. The teacher assigned an exercise to every student

(40) a. I loaded a wagon with every bail of hay
b. I loaded a bail of hay onto every wagon

Like 'there' in presentational sentences, the shifted argument confines D/NPs in its c-command domain to take narrow scope with respect to it.[22] Again, a straightforward explanation could be that this is due to its being the logical subject of the predication encoded.

[22]The same scope asymmetry holds of DECs in German, cf.:

(i) Einem Lektor entging jeder Fehler [only: a reader > every mistake]
A lecturer-DAT escaped every mistake

In English, matters are complicated by the fact that a D/NP corresponding to *every mistake* here has to appear to the left of and c-commanding a D/NP corresponding to *a lecturer*, presumably for case reasons. *Every mistake escaped a reader* is ambiguous in English.

# 5 Analysis: The predication in DECs, DOCs, shifted S/LCs, and PCs

In this section, we turn to a more detailed analysis of the format and contents of the predication we are looking at. The first subsection collects (the relevant parts of) the constructions under discussion into one: the structure encoding the predication in question is essentially that of an adjectival passive construction. Subsection 5.2 makes a proposal as to how the 'scope freezing' property that has been noted to pertain to the construction follows from how its structure encodes the ascription of a change of state (the reaching of an event's target state) to the shifted argument. In subsection 5.3, 'Argument shift' is argued to be rooted in the necessity of having subjects that provide a big enough restriction for their predicate to be assessed.

## 5.1 Changes of State and Target States, Adjectival Passive Constructions

The claim is that the predication we are looking at corresponds essentially to the ascription of a change of state to the shifted argument, where 'change of state' entails the 'perfection' of an event as encoded in a predicate with a clear 'target state'.

Which predicates encode a target state and which don't ? Following Kratzer (1994), I assume that the availability of adjectival passive constructions shows the encoding of target states. In a sense, maybe as a default, the adjectival passive realization of a predicate IS the target state associated with that predicate: an event of *feeding a cat* is expected or intended to result in a state where *a cat is fed* (cf. 1.1). Predicates that virtually never encode target states are lexically stative ones like *know*, *love* or *believe*. These predicates do not have adjectival passive realizations and are predicted not to enter the constructions under discussion, which is borne out:[23]

(41) a. *Eine Frau ist geliebt [Adj. pass.]
A woman is loved
b. *Da ist eine Frau geliebt [PC]
There is a woman loved
c. *Mir ist eine Frau geliebt [DEC]
Me-DAT is a woman loved
d. *Peter liebte Otto eine Frau [DOC]
Peter loved Otto-DAT a woman
e. **Peter beliebte eine Frau mit Blumen [shifted S/LC]
Peter BE-loved a woman with flowers

[23] Another test for the availability of a target state is the availability of prenominal adjectival participles. To exemplify with the morphosyntacically distinguishable variants of S/LCs, prenominal participles are available on the basis of shifted S/LCs but not on the basis of unshifted S/LCs:

(i) a. Ich malte Farbe an die Wand — *die gemalte Farbe
I painted colour at the wall — *the painted colour
b. Ich bemalte die Wand mit Farbe — die bemalte Wand
I be-painted the wall with colour — the painted wall

A test suggested by Mourelatos (1978) points the same direction: Count Event Nominals are available on the basis of the 'shifted' S/LC predicates but not on the basis of the 'unshifted' ones:

(ii) a. Die dritte Bemalung (der Wand)
The third painting (of-the wall)
b. *Die dritte Malung der Farbe
The third painting of-the color

At the other end of the scale, there is a class of predicates that virtually always encode target states, namely the syntactically unaccusative (Levin and Rappaport (1995)) and semantically agentless and telic ones (Dowty (1991)) – these predicates enter presentational constructions and dative experiencer constructions.

Constructions comprising unaccusative predicates in turn bear considerable similarity to adjectival passive constructions: Both have a 'perfective/result state' interpretation, both select *be* as auxiliary (a form of *sein* in German, making them clearly distinguishable from verbal passives that select a form of *werden* "become"), both obviously do not feed passive formation. In terms of thematic roles, they lack an agent argument but select a theme and a location argument, where this location argument is usually assumed to be optional (cf. e.g. Bresnan and Kanerva (1989)).

But is the location argument optional? The German data suggest otherwise. Consider the pair in (42) that involves a verb usually taken to project an 'unaccusative' structure (and that can be multiplied at will):

(42) a. *?Eine Vase ist gefallen
A vase is fallen
b. Eine Vase ist {auf den Boden, herunter-} gefallen
A vase is {to the floor, down-} fallen

Obviously, the realization of the location argument (be it as a locative PP or as a transparently locative prefix) matters for the availability of adjectival passive realizations, hence for the encoding of target states.[24]

Exactly the same pattern is exhibited in a pair that involves a verb usually taken to project a 'ditransitive' structure (and that can be multiplied at will):

(43) a. *?Ein schweres Erbe ist getragen
A difficult inheritance is carried
b. Ein schweres Erbe ist {in die naechste Generation ge-, ueber-} tragen
A difficult inheritance is {into the next generation PRF-, over-} carried

Interestingly now, the predicates on the basis of which adjectival passive realizations are available license a shifted argument also, where the resulting structure is a DEC and/or PC. (44) illustrates with a dative argument, (45) with the locative proform *da*:[25]

[24]Quite generally in German, adding a (directional) locative PP makes adjectival passive realizations available. The following inexhausive list gives an idea of the sort of prefixed verbs that achieve the same effect and could have been used just as well in the examples. For the (separable as well as inseperable) prefixes involved a locative origin is generally traceable (Kluge (1989), Maylor (1998)).

(a) 'ditransitive': *an-vertrauen* "on-trust", *ab-nehmen* "away-take", *an-kuendigen* "announce", *ueber-geben* "over-give (hand)", *ueber-mitteln* "over-mediate", *ueber-bringen* "over-bring", *vergeben, verzeihen* "forgive", *auftragen* "on-carry (order)", *aus-sprechen* "out-speak ", *aus-leihen* "out-lend", *ver-machen* "be-queathe", *ver-derben* "spoil", *be-fehlen* "order"

(b) 'unaccusative': *er-scheinen* "appear", *auf-fallen* "strike", *wider-fahren* "occur " *gelingen, gluecken* "be crowned by success", *ein-leuchten* "be enlightening", *ent-kommen, ent-gehen* "flee/get away", *ent-wischen, ent-kommen* "escape", *entgegen-kommen* "come toward ", *gegenueber-treten* "oppose"

[25]On a 'syntax as a feature checking algorithm' perspective, the following pair from German suggests the syntactic (near-) equivalence of dative D/NPs and locative *da* – For syntactic well-formedness, it does not matter whether an elementary clause contains just *da, da* and a dative D/NP or just a dative D/NP:

(i) a. Da wurde erzaehlt [$_{CP}$ dass Otto geheiratet hat]
There was told [$_{CP}$ that Otto married has]

(44) a. Otto ist eine Vase {heruntergefallen, entglitten}
Otto-DAT is a vase {down-fallen, away-slided}
b. Otto ist ein schweres Erbe {uebertragen, in die Wiege gelegt}
Otto-DAT is a difficult inheritance {across-carried, into the cradle laid}

(45) a. Da ist ein Geist {erschienen, aufgefallen} [PC]
There is a ghost {appeared, up-fallen}
b. Otto ist ein Geist {erschienen, aufgefallen} [DEC]
Otto-DAT is a ghost {appeared, up-fallen}

The formation of adjectival passives is a matter of considerable debate. There seems to be a general consensus however that adjectival passive constructions are not derived from 'richer' structures via syntactic manipulations (Borer (class lectures), cf. e.g. Wasow (1977), Bresnan and Kanerva (1989) Kratzer (1994)).

Assume then that (a) syntactic structures feed interpretation and that (b) adjectival passives are not syntactically derived from more 'developed' structures. We have seen evidence above (cf. 3.2) that fully fledged DOCs (as well as shifted S/LCs) encode a meaning structurally that is essentially that of an adjectival passive construction. We have now seen that an adjectival passive (/unaccusative) construction crucially involving a location argument suffices for the licensing of a shifted argument. Given what has been discussed above, the obvious candidate for the licensing relation is predication. Given that the adjectival passive constructions involving 'unaccusative' and 'ditransitive' predicates have the same selectional properties, look the same and are interpreted the same way (essentially as change of state 'at' the shifted argument), the strong conjecture is that they share the same structure. Abstracting away from the copula, I propose that this structure is as given in (7) above.[26]

## 5.2 The construction of target states: Explaining the scope asymmetry

To arrive in a systematic way at the predication we are looking at, let us consider the role of the constituents involved in their 'bottom up' order, that is, start with the structurally lowest constituent. For perspicuity, I will go through a concrete example given in (46) with the assumed (rough) structure given with the gloss:

b. Mir wurde da erzaehlt $[_{CP}$ dass Otto geheiratet hat]
Me-DAT was there told $[_{CP}$ that Otto married has]

[26] As cannot be shown here for reasons of space, the structures in (43) – (45) are not just superficially similar, but share also 'deep' syntactic properties. Essentially, they pass the standard tests for 'unaccusativity' (ne- cliticization in Italian, (backward) binding, prenominal adjective formation etc.). Discussing similarities and differences between what are called 'adjectival passive' and 'unaccusative' constructions at more detail is however a delicate issue deserving more space than can be offered here. Giving just one example bearing on the issue at hand, patterns pertaining to quantifier stranding and *was fuer* split as we have seen already in (12) and (13) in the context of presentational *there* sentences show that the dative argument c-commands the theme before movement:

(i) a. Versprecher$_i$ sind **Meteorologen** einige$_i$ zugestanden
Slips-of-the-tongue$_i$ are **meteorologists** some$_i$ admitted
b. *Versprecher$_i$ sind einige$_i$ **Meteorologen** zugestanden
Slips-of-the-tongue$_i$ are some$_i$ **meteorologists** admitted

(ii) a. Was$_i$ sind **Meteorologen** [fuer Versprecher]$_i$ zugestanden ?
What$_i$ are **meteorologists** [for slips-of-the-tongue]$_i$ admitted ?
b. *Was$_i$ sind [fuer Versprecher]$_i$ **Meteorologen** zugestanden ?
What$_i$ are [for slips-of-the-tongue]$_i$ **meteorologists** admitted ?

(46) (Die Götter haben) einer Familie aus Theben jedes erdenkliche Unglück in
(the gods have) [[a family from Thebes] [[every thinkable misfortune] [into
den Stammbaum geschrieben
the family-tree written]]]

As to the contribution the PP complement makes to semantic interpretation, I propose that together with the lexical verb it supplies the predicative part of the target state of the event in question – we have seen that the presence of a locative complement (prefix) is crucial for the availability of a target state. The following representation roughly corresponds to the compex predicate expression 'into the family tree written':

(47) $\lambda x$ [written-into-the-family-tree(x)]

Next, we apply this predicate to the standard GQ denotation of the direct object. The constituent 'every misfortune into the family written' can then be represented as follows:

(48) $\forall x$ [thinkable misfortune (x) $\rightarrow$ written-into-the-family-tree (x)]

What we have here is a formula (type-theoretically: a truth value). At this point, the view taken here on the role syntactic derivations play for interpretation comes in crucially: The idea is that the whole of (48) defines the target state in question. What we have in (48) – a timeless proposition – is interpreted at the vP level only as something time-dependent, namely as the target state of an event. It is in this sense that the direct object 'incorporates' into the predicate: It codefines the target state which in turn is the defining property of the event in question.

Essentially, this amounts to reinterpreting the formula as a function from events to times to truth values. I assume that this 'promotion' goes along with movement of the lexical verb to the 'light verb' position.[27]

(49) $\lambda e\ \lambda t$ [((∀x (misfortune(x) $\rightarrow$ written-into-the-family-tree (x)))(f-target(e)))(t)]

This denotes the set of events e such that the times t at which their target states hold are times that make true the state of affairs corresponding to *every misfortune is written into the family tree*. Applying the perfect operator (cf. 1. 2), we get:

(50) $\lambda t\ \exists t_1\ \exists t_2\ \exists e$ [¬ ((∀x (misfortune(x) $\rightarrow$ written-into-the-family-tree (x))) (f-target(e))) ($t_1$) & ((∀x (misfortune(x) $\rightarrow$ written-into-the-family-tree (x))) (f-target(e))) ($t_2$) & $t_1$, $t_2$ $\leq$ t & $t_1 \prec t_2$]

This is the set of times t that are such that there is an event e that has occurred such that its target state (that every misfortune is written into the family tree) does not hold at a time $t_1$ that is included in each of the times in this set and does hold at a time $t_2$ that is also included in each of the times in this set.

[27] A more compositional (in the standard sense) solution would be to start out with a free-variable version of (49) and defer (only) lambda abstraction to the functional layer above VP. The intended analogy here is with a substantive operation of 'predication' as assumed in property theories, cf. Chierchia (1985), Bowers (1993). Cf. especially Chierchia (1989) for the assumption of an operation of 'expletivization' turning a proposition into a predicate. Cf. Pesetsky (1989) for argument in favor of main verb movement particularly with predicates involving locative complements.

The last step is applying this predicate to the shifted argument. I propose that it is not interpreted as an ordinary object, but really as the spatiotemporal correlate of the object as denoted by the D/NP in the pertaining position (cf. Quine (1960, p. 171), Strawson (1959, p. 218ff)), the unique (space-) time that this object occupies. We get to this time via a function '$\tau$' that maps (ordinary) individuals onto the spacetimes they occupy – such a function is sometimes assumed for the mapping of events onto their run-times (cf. e.g Galton (1984), Krifka (1998)). The unique time that the referent of the shifted argument occupies has the property then that an event of *writing every thinkable misfortune into the family tree* has occurred in it:

(51) $\exists t_1\ \exists t_2\ \exists e\ ...t_1,\ t_2 \leq \tau$(family from Thebes)

The theme argument cannot take scope over the shifted argument because it belongs to the event description in turn combining with the perfect operator yielding the predicate that licenses the shifted argument: it is incorporated or 'frozen' in the expression encoding the property that is ascribed to the shifted argument. The scope asymmetry is the asymmetry of predication then.[28]

### 5.3 The predicate restriction: Motivating 'argument shift'

Picking up the issue of target states as made available by 'perfected' events (as understood to correspond to the binding of the pertaining event variable), consider the following pair adapted from Basilico (1998). Here, the passive realizations of an oblique object construction (OOC, cf. 1.1) and a DOC respectively have been put into a presentational context.

(52) a. There were suitcases given to politicians
$\exists x$ suitcase(x) & given-to-politicians(x)
$\exists e$ give-suitcases-to-politicians(e)
b. ?There were politicians given suitcases
$\exists x$ politician(x) & given-suitcase(x)

While in (52a) an 'event' reading is available, this reading is absent in (52b). On the assumption that *there be* corresponds to an existential quantifier along the lines of Milsark, the contrast could be explained as follows: *There be* has to bind a variable since vacuous quantification is banned. In (52a), *there be* may bind either the individual variable restricted by *suitcases* or the event variable provided by the predicate. In (52b), the event variable is not available for binding. On our assumptions, it is bound lower in the structure by the perfect operator situated above vP. (Linguistically spoilt) speakers do not judge (52b) good, saying they feel a 'definiteness effect': *Politicians* should not be in a presentational context since it is interpreted 'specifically'. This is in line with what has been argued, namely that the shifted argument is interpreted strong qua being a subject of predication, which could be why it does not lend itself to binding by *there be*.[29]

[28] If one adopts a quantifier raising approach to scope, this implies that QR is restricted with respect to predication. If it is clauses (projections of material relating to temporality, cf. 1.3.4) that encode predication, this is not far though from the standard idea that clauses restrict QR.

[29] The pattern shows once more that to the extent that presentational sentences have to do with quantification, there is good reason to assume that DOCs (and shifted S/LCs) indeed encode a predicate comprising a bound event and as a consequence a 'target state'. What the pattern also shows is that we cannot attribute the 'perfective' interpretation to the 'perfective' morphology since this leaves the availability of the eventive reading in a unexplained. That 'perfective' morphology is not responsible for 'perfective' interpretation has been independently argued by several authors (e.g. Kratzer 1994, Iatridou et al. 2000.)

Maybe unsurprisingly, we find a similar effect with 'unaccusative' predicates, where now the difference involves choice of 'progressive' versus 'perfective' tense:

(53) a. There were flowerpots falling from the balcony
∃e flowerpot-falling-from-balcony(e)
b. ?There were flowerpots fallen from the balcony
∃x flowerpot(x) & fallen-from-balcony(x)

Again on a Milsarkian approach where *there be* is taken to correspond to an existential quantifier, we could explain (53b) saying that the event variable is bound and that *flowerpots* does not lend itself to quantification since it receives quantificational force qua being the subject of predication. However, several questions arise: First, assuming vacuous quantification to be strictly banned, we predict strong ungrammaticality, which we do not find however. Second, the idea that *there is* corresponds to an existential quantifier hardly agrees with the idea that *there* is in fact interpreted strong, that it corresponds essentially to a definite D/NP. Third, expressions usually taken to be referential – like definite D/NPs – are not across the board excluded from the 'scope' of presentational sentences (cf. McNally (1998a)).

We assume that *there* is in fact an individual expression denoting *here and now / there and then*, as proposed by Kratzer and Kiss. (52b) and (53b) above are not odd due to a property of what is traditionally called the 'associate D/NP' of *there* then. The reason why they are bad is really that the (space)time denoted by *there* is too small to contain the bound event. Being atomic, it cannot accommodate both a time at which the target state does not hold and a time at which it holds.

That something like this might be on the right track is suggested by a fact that seems closely related: In English or Russian, sentences in simple present tense expressing events do not refer to the present time (*here and now*) but rather to the future. A way to repair this in English is to use present progressive tense – as a result, the predicate shares crucial properties with stative predicates (such as the subinterval property). In particular, it can be evaluated with respect to a single atomic time. There may be a more general clash then between 'perfected' eventive predicates and something like atomic (space)times, where natural languages may treat deictic *there* as well as simple present tense as referring to such an atomic space time (cf. discussion in Galton (1984)). One could maybe say that deicitc *there* combined with a completed (bound) event is in conflict with something like the 'conservativity' property as pertaining to Generalized Quantifiers: The time it denotes could not have as parts the times that would be necessary to assess the predicate. Call this the 'conservativity conflict'.

That it could be the deictic *here and now* interpretation of *there* that is responsible for what is known as the 'predicate restriction' since Milsark is corroborated by the fact that definiteness effects often seem to be much weaker in the simple past, an essentially anaphoric tense, cf.:

(54) a. ?*There is a guy awarded the Fields medal at the party
b. ?There was a guy awarded the Fields medal at the party

We expect then that the referring abilities of the element corresponding to *there* are a (maybe the) crucial factor for the strength of effects pertaining to the 'prediate restriction' and a (maybe the) locus for parametric varation: Roughly, languages treating *there* as essentially deictic should exhibit stronger effects than languages where *there* is more ready to refer anaphorically (and/or abstractly).

The 'conservativity conflict' does not arise at all if the shifted argument's denotation is 'big enough' to assess the predicate from the start. This is the case when an 'object denoting' D/NP fills this position, which is however interpreted as its 'spatiotemporal correlate' there. This (space-) time is 'big enough' to assess the predicate:

(55) a. ??Da ist ein schweres Erbe auferlegt
There is a difficult inheritance laid-on
b. Spaetgeborenen ist ein schweres Erbe auferlegt
Born-lates is a difficult inheritance laid-on

A similar effect obtains when the theme argument appears sentence-initially. The following example illustrates in comparison to the 'dative' case, where the intended interpretation for (56a) is deictic ('Look there are apples ...'):

(56) a. ??Da sind Aepfel den Abhang hinuntergepurzelt
There are apples the slope down-tumbled
b. Mir sind Aepfel den Abhang hinuntergepurzelt
Me-DAT are apples the slope down-tumbled
c. Aepfel sind (da) den Abhang hinuntergepurzelt
Apples are (there) the slope down-tumbled

Fronting the theme argument as in (56c) seems to be another way of solving the 'conservativity conflict' then. But is *apples* the logical subject of predication here ? Rather not. First, it has moved presumably from a lower position (cf. above (12), (13), (46), (47)) and we do not expect predication – a 'deep' thematic relation - to be established through movement. Second, witness that *apples* needn't receive a strong (generic) interpretation, which would be predicted if it were the subject. (56c) can mean that there were some apples that had tumbled down the slope. The fronted argument in (56c) is however interpreted as the topic of the sentence (in a broad sense) – I propose that this enables (silent) *there* lower in the structure to pick up the (space-) time it occupies as its referent, that is, *there* refers anaphorically in (56c).

'Argument shift' is then a direct way of providing a big enough restriction for the predicate to be assessed, substituting a D/NP that is interpreted as its (spatio-) temporal correlate for *there*. 'Argument fronting' is an indirect way of solving the 'conservativity conflict', by providing an antecedent for *there* which is then interpreted anaphorically.[30]

## 6 Conclusion: Results, Implications, Outlook

This section sums up the main results, providing (short) answers to questions that have been addressed and/or arisen in the course of the above discussion.

[30]In English, a parallel case could be:

(i) a. ??There were children grown up
b. Children were grown up (there)

## 6.1 Structure and Interpretation

To the extent that the above has some substance, it suggests that grammar is 'uniform' also at a more 'constructional level' in employing 'simple' constructions as parts of more complex constructions, where a structure akin to that of a presentational sentence has a prominent role. While it remains to be seen whether this hypothesis can be further established, it seems to lead some way toward explaining a range of facts that seem mysterious otherwise:

The interpretive properties of what have been called 'shifted arguments' here follow from their status as logical subjects, entailing a presupposition of 'existence', or rather: 'location'.

The argument-atypical behavior of the shifted arguments (control, secondary predication, passivization etc.) is rooted in the 'defectiveness' of their featural makeup which in turn is a reflex of their locative nature. 'Blocking effects' (to be discussed in detail in Brandt (in progress) associated with the presence of the shifted arguments follow from their being subjects of predication. Assuming that predication proper entails temporal location, the structure in which they are licensed is essentially clausal (at least comprising material related to temporal location).

The often noted 'perfective meaning' of the structures under discussion follows from the nature of the predicate: It corresponds to the set of times comprising a particular change of state, where this change of state consists in the bringing about of the 'target state' as encoded in the predicate.

For the complex constructions under discussion (DOCs and shifted S/LCs), the intuition that these encode 'possession' is better explained by the structures' comprising a structure akin to that of a presentational *there* sentence, where the predicate involves a change of state.[31]

The scope asymmetries/ scope freezing properties of the constructions have been proposed to follow from the lower argument's 'incorporation' into the target state that defines the event encoded and bound lower in the structure: The lower argument is part of the complex property ascribed to the shifted argument and therefore cannot scope out.

It has been proposed that the shifted arguments occupy the positions they do fulfilling a semantic well-formedness condition: subjects have to be 'big enough' for their predicates to be assessed.

## 6.2 Aiming back at 'bare' presentational sentences

Lexically stative predicates are ruled out from the constructions that have been discussed since they do not encode a 'target state'. While a class of presentational sentences comprises unaccusative predicates of appearance/ coming into 'awareness' – and are therefore 'change of (mental) state' – the question arises as to what should be said about 'bare' presentational sentences not comprising such a predicate. I see no reason why these shouldn't have a structrue as depicted in (7) above. The suggestion is that the verbal part of the predicate may remain unpronounced due to its minimal conceptual content. Language may have it not only that *to be is to be somewhere* but also that *to be somewhere is to be PERCEIVED somewhere*. Thus we could have the following parallel:

(57) a. There appeared a man in the garden
b. There was PERCEIVED a man in the garden

[31] Among other things, it follows from this that they do not generally carry an entailment that be sensibly analyzed as involving HAVE: The state succeeding the event as encoded in the lower predicate is (as a default) just what the adjectival passive realization of the predicate expresses: A letter has been sent successfully in this sense as soon as the letter is away from the sender.

It has been proposed that in DECs, DOCs and shifted S/LCs, the shifted arguments have to occupy the positions they do to provide a big enough restriction for the (lower) predicate to be assessed. Analogously in bare presentational sentences, one would want to argue that the predicate itself has to raise to achieve this effect, cf.:

(58) For example,

a. ... there is perceived by sight an object extended, coloured, and moved.

b. ?*...there is an object extended, coloured, and moved perceived by sight (Berkeley (1710), Introduction)

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# Measure instrumental in Russian*

## Abstract

We will argue that some seemingly adverbial free DPs in the instrumental in Russian which are traditionally termed *measure instrumental* are best understood as secondary predicates. We present the relevant syntactic assumptions and propose a semantics of this use of DPs in the instrumental. This proposal bears on the distinction between adjunct modification and secondary predication.

## 1 Introduction

Russian displays a curious use[1] of non-argument (i.e. free) NPs in the instrumental case illustrated in (1). The use requires a NP in plural (we use DP in the following).

(1) a. On pil vino stakanami
He drank wine glasses-instr
He drank wine by the glass

b. *On pil vino stakanom
He drank wine glass-instr

This use is sometimes subsumed under *instrumental of manner*. But we consider this use to be exemplified also by (2), where there is a measure-DP in the instrumental hence we shall call it *measure instrumental*.

(2) a. On pil vino litrami
He drank wine liter-instr
He drank wine by the liter

b. *On pil vino litrom
He drank wine liter-sg;instr
He drank wine by the liter

Intuitively we measure some object of discourse in terms of a unit of which there must be more than one with a possible additional implication sometimes, that the result is rather bigger then expected. The difference between (1) and (2) disappears, if we assume that *glasses* can serve to denote measure units by the process of metonymy. Another curious property of measure instrumental is that it disallows numeric specification, cf. (3).

*We would like to express our great thanks to Manfred Krifka for his valuable criticism.

[1]The Academic Russian Grammar distinguishes two uses of this kind, the temporal and the qualitative. Both are considered to be a subcase of the general meaning of the instrumental the Grammar calls *opredelitel'noe* (determinative, attributive). Cf. (Švedova, 1980, vol. I, p. 482 and vol. II, p. 434p)

(3) *On pil vino p'at'ju litrami
He drank wine five liter-instr
He drank wine by five liters

It seems that if we treat the instrumental use of the instrumental case (i. e. when a DP in the instrumental is used to denote an instrument) as a DP- adjunct and semantically an adverbial, i. e. a predicate on events, the best solution would be to treat the measure instrumental as an adjunct and an adverbial, too. However, this use is not really instrumental, since even if we conjure up some obscure kind of instrumentality to be involved in the reading, a real instrumental allows singular whereas the measure use does not, though singular measure DPs are perfectly OK in other contexts, cf. (4).

(4) a. On razbil okno stakanom
He broke the window glass-instr
He broke the window with the glass

b. On otmeril odin litr
He measured one liter-acc
He measured off one liter

Some other interesting things about measure instrumental can also be summed up by the statement that if we treat this use as a manner adverbial expressed by a DP-adjunct and measure the event directly, we will experience difficulties.

First, we need a derivative measure on events, since we actually measure some quantity of other stuff. We measure the stuff quantity which is expressed by the direct object in (2). We cannot directly encode what objects are the base of the measure though, because the use allows to measure quantities of different objects of discourse, cf. (5,6,7,8).

(5) On nedel'ami čital etu knigu
He weeks-instr read this book
He was reading the book for weeks

We measure the quantity of time which is associated with the temporal course of the situation described by the sentence.

(6) On xodil kilometrami (peškom)
He went kilometers-instr (on foot)
(He used to walk kilometers and kilometers on foot)

Here we measure the spatial quantity of each of the *different* walks (i.e. paths traversed) which are involved in interpreting the iterative use of the verb.

(7) Jajca pokupalis' des'atkami
Eggs bought-refl tens-instr
Eggs were bought by tens

In this sentence we measure the number of the entities denoted by the plural subject of the passivized sentence.

(8) Ludi sxodilis' tolpami
People went-refl crowd-instr
People were gathering in crowds

This is a very loose measure on human pluralities applied to the plurality denoted by the subject. In general, the measure should just make sense intuitively, i. e. there seems to be a fair amount of reasoning involved cf. (9).

(9) Bumagu tratili kilometrami
Paper-acc squander-3pers-pl kilometer-pl-instr
The paper was squandered/they squandered the paper by the kilometer

The second difficulty in the adverbial treatment of this use of DPs is that some syntactic constraints on the reading seem to be operative, too, since the reading is unavailable wrt. indirect objects or prepositional phrase adjuncts, cf. (10,11,12).

(10) My davali im den'gi$_i$ pačkami$_i$
We gave them money pack-instr
We gave them money in packs

(11) *My davali im$_i$ den'gi tolpami$_i$
We gave them money crowds-instr
We gave them money (and they were) in crowds

(12) *My xranili arbuzy pod krovat'ami$_i$ des'atkami$_i$
We preserved water-melons under beds tens-instr
We preserved the watermelons under beds (and the beds were) in tens

On the other hand there are also semantic constraints on the verb, which require that the verb is imperfective or allows an iterative reading, cf. (13,14,15), so that we might conjecture that the structure of the event plays some role, too.

(13) *Policija arestovala demonstrantov$_i$ sotn'ami$_i$
Police arrested-perf demonstrators hundreds-instr
The police arrested the demonstrators by the hundred

(14) Policija arestovyvala demonstrantov$_i$ sotn'ami$_i$
Police arrest-imperf demonstrators hundreds-instr
The police was arresting the demonstrators by the hundred

(15) *Ja pročital etu knigu nedel'ami
I read-perf book weeks-instr
I (have) read the book in weeks/during weeks

(16) *Ja vypil vino stakanami
I drank-perf wine-acc gasses-instr
I drank (have drunk) the wine out by the glass

Such constraints seem to be in agreement with the hypothesis about the adverbial status of measure instrumental DPs. What are then the syntax and the semantics of these DPs? Are they DP-adjuncts, modifying the event, or are they something else?

We propose a syntax and a semantics of this use which treats plural DPs in instrumental case which denote measure units as secondary predicates. We adopt the proposal by Bowers and Bailyn that they are syntactically adjuncts with a specific structure: a functional category of predicates ($PredP$) constituting a small clause of sorts. We will also provide a semantics for them which is based on Krifka's notion of $\theta$-role homomorphism (Krifka, 1998). Under this treatment a NP in the instrumental is a secondary distributive predicate with the intrinsic meaning "more than one" provided by the plural. This accounts for the lack of singular in this use. The secondary predicate introduces an event which is distributive and measures the event introduced by the main clause via the $\theta$-role homomorphism. Thus, the restriction on the imperfectivity can be met. The distribution takes place because the event of the main clause and the event introduced by the second predicate share a participant. We suggest that measuring the event is semantically lowered to measuring any entity in the core part of the event. In other words, measuring it gives a characterization of an event in terms of its participants. We assume that the semantics involves the notion of inferential interpretation of an underspecified semantic structure relative to other possible interpretations. The interpretation leading to the measure instrumental consists in (a) employing the intrinsic meaning of the plural (more than one) to make an assertion and (b) to weakly measure the event in terms of its homomorphic characteristic discourse objects, if measuring can be done. The assertion is that the event is distributed according to the measure with the unit given by the predicate. The interpretation also specifies what the basis of measurement for the event distribution is in terms of the core discourse referents (i.e. what is measured). The discourse referent which is measured is syntactically constrained, so we have reasons to believe that this is indeed a secondary predicate in terms of the model of predicative structure of Bowers and Bailyn. The theory we propose allows us to draw a distinction to the temporal use of instrumental in (17).

(17) Letom on často bolel
Summer-instr he often be-ill
In summer he was often ill

## 2 The Syntax of Secondary Predicates in Russian

We consider the majority of uses of instrumental case DPs in Russian to be secondary predicates (Demjjanow and Strigin, 2000a,b). We want to exploit this idea in the present case too, and consider measure instrumental to have the same syntax as depictive adjectival predicates, which also occur in the instrumental.

As far as the syntax of secondary predication in Russian is concerned, we shall treat secondary predicates in Russian as linguistic constructs sui generis. In other words, these are syntactically specialized constituents with an associated interpretation. This section deals with the syntax of secondary predication in Russian, the next one with the semantics of secondary predicate measure instrumental.

The brand of the syntactic theory used here[2] assumes that syntactic trees are binary. Granted the usual semantic definition of a predicate secondary predicates (SP, also for *secondary predication*) could potentially vary in the following two parameters:

[2]Chomsky (2000) is the latest development.

1. the secondary predicate is a separate constituent vs. is always embedded into some other constituent;

2. the secondary predicate or the constituent which embeds it is itself a complement or an adjunct.

We will proceed on the following assumption of categorial uniformity:

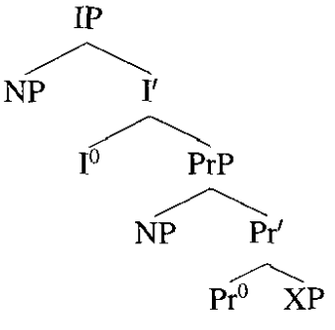
**Categorial Uniformity of SP**

In all cases a secondary predicate is embedded in a uniform predication structure, i.e. a constituent of one characteristic type. The predication structures are distinguished according to their status: a primary predication structure is selected by a functional category providing temporal interpretation, say $T$, for definiteness, whereas a secondary predication structure is an adjunct to a category or a complement of a verb.

We consider however the second variation parameter to be free at least inasmuch as the position of an adjunct in the syntactic structure may vary, perhaps accompanied by some variation in the semantics, too.

As far as we know, the assumption concerning the syntax was first made by Bowers (1993)[3]. According to him any English sentence has at least one (i.e. primary) predicative constituent, as in (18). Bowers uses $I$ in the cited paper, and $T$ in Bowers (2001). We shall keep the notation of the examples.

(18)



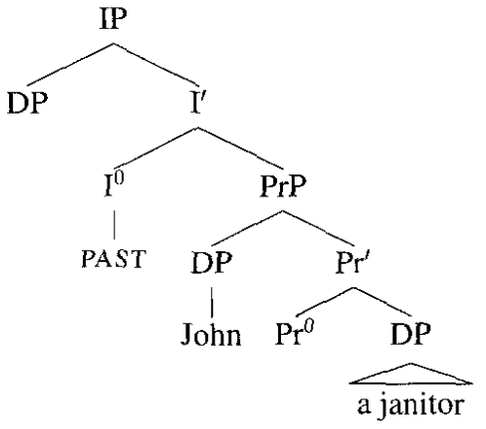

The *XP* constituent in this scheme can be any major constituent with head in *V, A, N, P*, according to Bowers.

A simple copula sentence like (19) could have a partial syntactic structure like in (20). We shifted from *NP* to *DP*.

(19) [ [ John ]$_i$ [ was $t_i$ a janitor. ]]

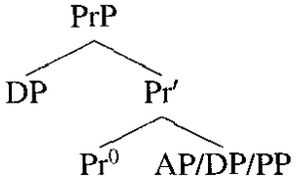
[3]His use of the terms *primary predication* and *secondary predication* in the Appendix of the paper does not coincide with ours!

(20)




Secondary predicates have then the structure in (21).

(21)



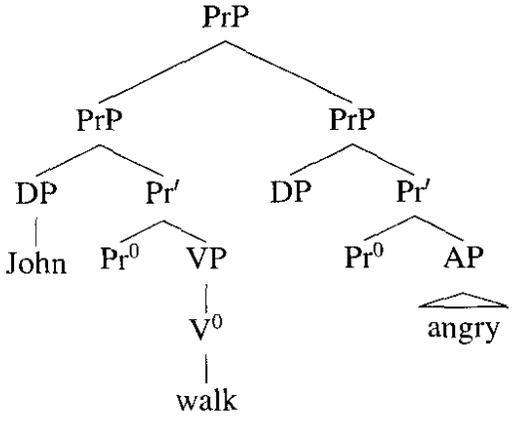

Consider the possibilities of secondary predication in English opened up by Bowers' syntactic model. We have three questions to answer. First, what is the syntactic site at which secondary predication phrase occurs, second what is the nature of the subject of the secondary predication phrase and third what is the relation between the host (i. e. subject of the secondary predication) and the subject of the predication phrase.

Depictive secondary predicates are treated in Bowers (2001) as small clause adjuncts. The sentence (22) gets the relevant structure in (24), sentence (23) that in (25).

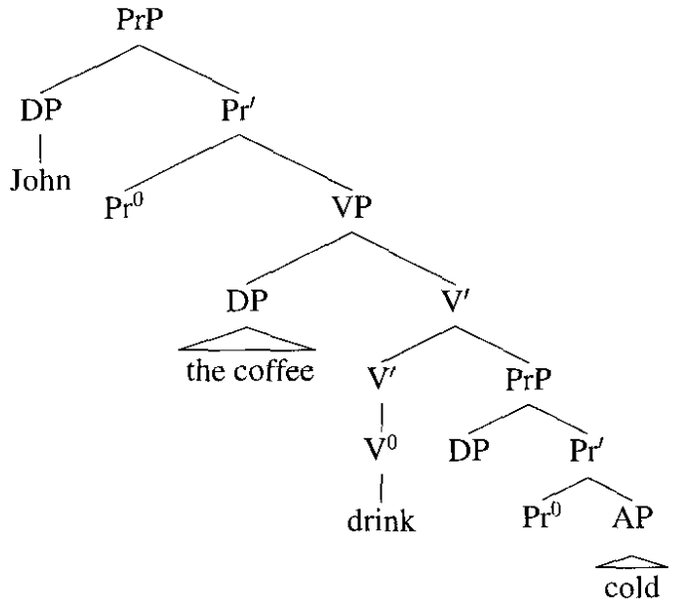
(22) John walked angry.

(23) John drank the coffee cold.

(24)



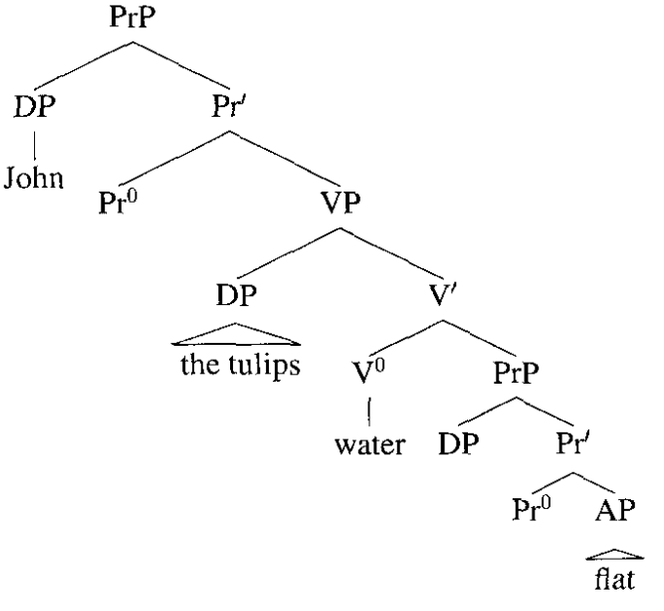
(25)




Resultatives are usually subdivided into weak and strong, cf. (Wunderlich, 1997). Weak resultatives have a secondary predicate which characterises the resulting state of the object of the verb, strong resultatives characterise the state of an argument which only is acceptable in the secondary predication construction and the verb is not sucategorised for it in the normal environment. Weak resultatives, e. g. (26), receive the relevant structure in (27), strong resultatives, e. g. (28), that in (29).

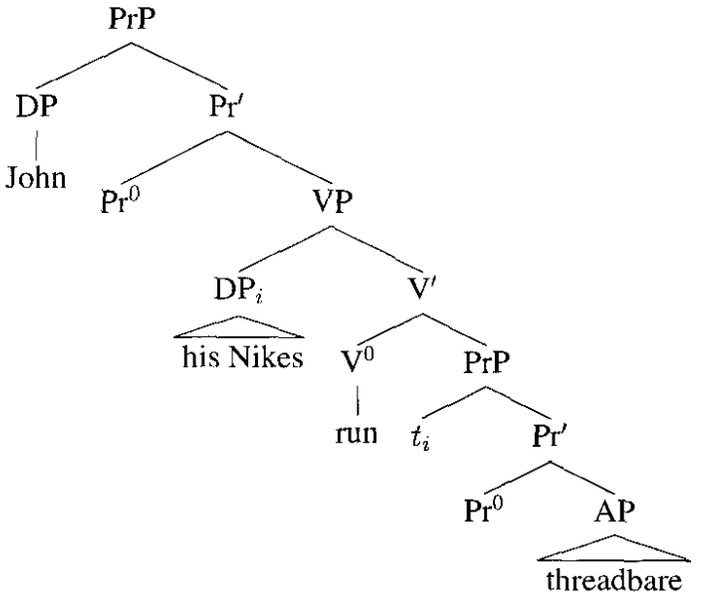
(26) John watered the tulips flat.

(27)




(28) John ran his Nikes threadbare.

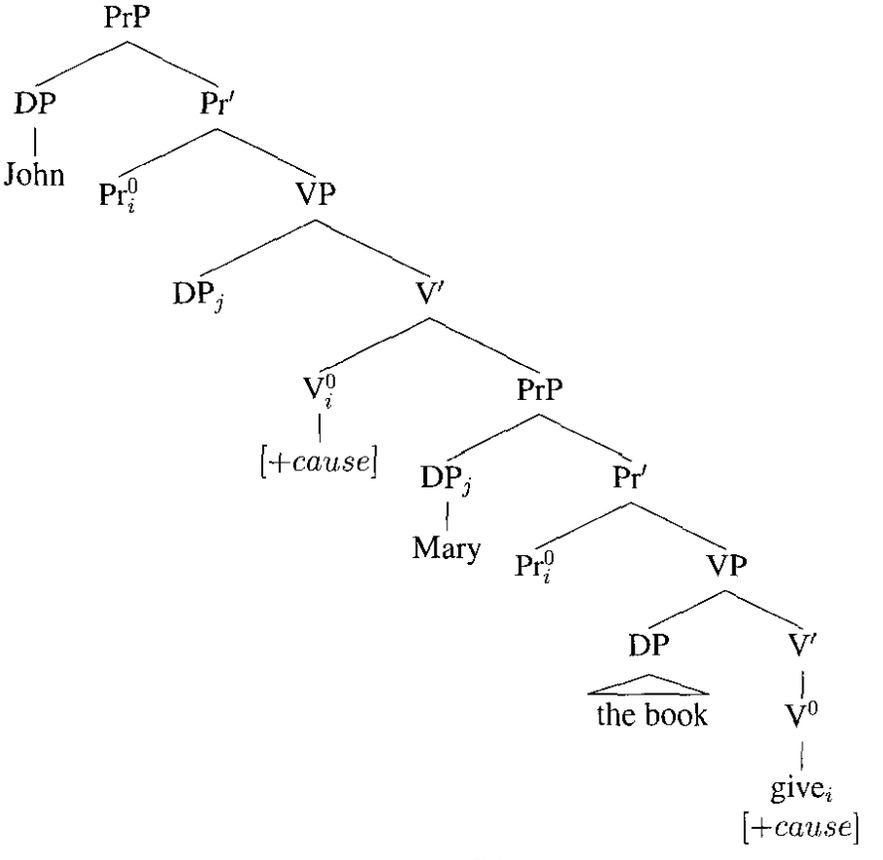
(29)




Some verbs have three arguments. Bowers distinguishes verbs which take both a direct and an oblique object from verbs which take two direct objects at a first glance. An oblique object is simply the complement of $V$. This structural positioning will be important in a moment. The quasi-ditransitive verbs on the analysis given by Bowes are actually syntactically complex predicates, i. e. they are embedded in a second predicative phrase. Bowers codes this characteristics of such verbs by assigning them a special *syntactic* feature which he terms [+CAUSE] and which should be checked in the appropriate environment. The verb *give* is an example, cf. (30). Note that there is no syntactically reflected semantic decomposition, we have only a feature, which however is probably usually assigned to causative verbs.

(30) a. John gave Mary the book.

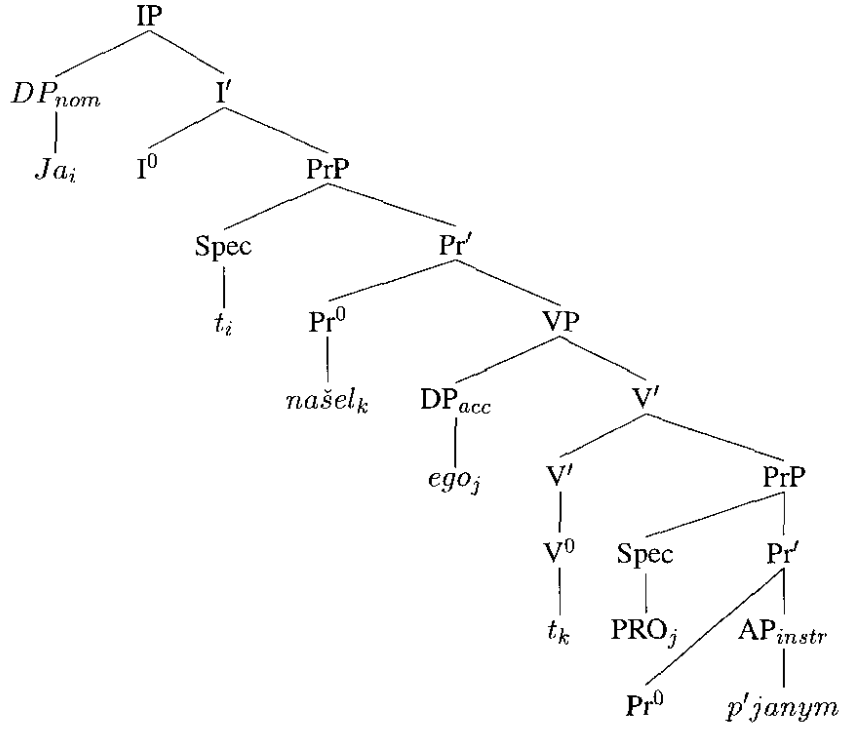
b.



To obtain the surface word order, the verb *give* moves to the head of the chain indexed with $i$ via the intermediate positions to check the feature [+CAUSE], and the DP *Mary* moves to the head of the chain indexed with $j$. This characterizes the DP as the subject of one predication and the direct object of another. The necessary condition is, of course, that the semantics of the verb marked [+CAUSE] decomposes in this way.

We will adopt this structure for our purposes, but will have to say something about Russian, of course. Bailyn (1995) and Bailyn and Citko (1999) are two proposals to treat secondary predication in Russian. Russian does not have the resultative interpretation of SP, but does have depictive predicates. The $AP$-predicate is either in the instrumental or has the case congruent to that of its host. Bailyn assumes the structure proposed by Bowers for the start and suggests that the instrumental case is assigned by the $Pr^0$ head of the predicate phrase to a case-bearing predicate.

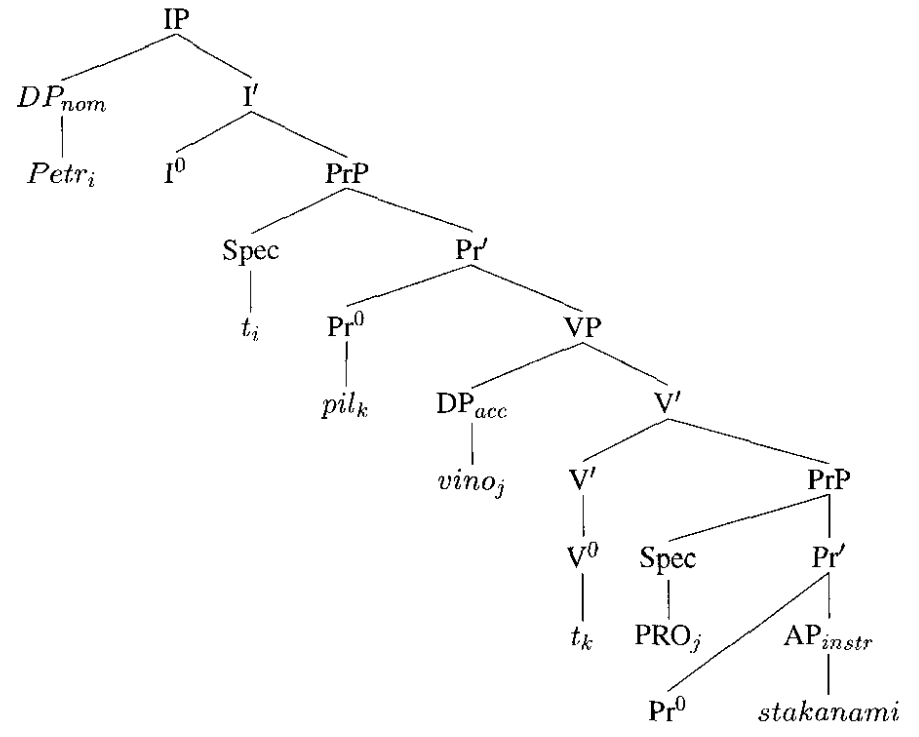
(31)




I(nom) found him(acc) drunk(instr)

Russian has several other uses of DPs in the instrumental, including the use as measure instrumental we are now discussing. We will assume that measure instrumental is a further example of the structure which is assigned to depictives. This will answer the first question about the adjunction site.

(32)




Peter(nom) drank wine(acc) glasses(instr,pl)

We must now say (provisionally) something on the status of *DP* in the secondary *PrP* here. According to Bowers it is a phonetically null *PRO*-noun controlled from the primary predication structure, either by the subject (*SpecPrP*) or by the secondary subject (i. e. direct object, *SpecVP*). Given the standard assumption that the controller of $PRO$ should be the closest c-commanding element we immediately obtain the syntactic restriction of the use of measure instrumental: neither the oblique object, which is a sister to $V^0$, nor the $DP$ in the adjunct prepositional phrase are able to control $PRO$. There are, of course, many more things to be said about this design decision which we relegate to the footnotes here, however, as points to be discussed[4].

To answer the third question about the relation between the host and the secondary predicate, we should note that $PRO$-control is not usually supposed to cover the path and the temporal hosts of secondary predicates. We will assume that in Russian implicit controllers of $PRO$ are possible, if they are consistent with the syntactic constraints. We must provide a formalization of this implicit control, of course.

The interpretation of the SP construction is thus an important point.

[4]Following Borer (1989) and Huang (1992), fn. 2, we do not distinguish between *PRO* and *pro*, and consider the whole predication constituent to be anaphoric, rather than the PRO-element, although we stick to the terminology of the quotations. We therefore consider the null subject of a small clause and the null subject of a null-subject finite sentence to be the same element. The proposal that depictives are small clauses with a *PRO*-subject dates back at least to Hornstein and Lightfoot (1987). Winkler (1997) criticized it, but inconclusively so, in our opinion. Both Franks and Hornstein (1992) and Huang (1992) seem to envisage the small clause with the *PRO*-subject as an explication of the notion of controlled predicate, i. e. a predicate, for which the choice of a subject referent is not entirely free, but is not rigidly fixed by the governing functional category, as in primary predication, either. The term *controlled predicate* is ours.

# 3 The Interpretation of the Predication Terms

## 3.1 The Predicate: the semantics of the measure instrumental

In discussing our views on the semantics of the measure instrumental we will use the representational format of the Discourse Representation Theory, DRT, (Kamp and Reyle, 1993). We adopt the view that an interesting theory of measure instrumental should at least attempt to explain the apparent diversity of uses of the DPs in the instrumental by reference to some common core. We take this common core to be the semantic relation of predication accompanied by different contextual accommodations. This approach takes therefore the measure DP in the instrumental to be a predicate.

It is impossible to recapitulate the whole DRT here, and we simply sum up the main technical conventions in the appendix. But some general remarks are in order. We postulate a sorted domain of discourse which contains individuals, atomic and plurality, events and event complexes, states and state complexes[5], and abstract measure units. Every one of these sorts including that of measure units is a complete atomic free upper semi-lattice with a bottom element $\perp$. Thus, every sort is a set $S$ with a partial ordering relation $\leq$ on it such that for all $X \subseteq S$ the least upper bound, l.u.b, $\bigvee X$ exists ($S$ is complete), for all $a, b \in S$, if $\neg a \subseteq b$, then there exists an atom $c$ such that $c \subseteq a$ & $\neg c \subseteq b$ ($S$ is atomic), for all $a \in S$, $X \subseteq S$, if $a$ is an atom, and $a \in X$, then there is a $b \in S$ such that $a \leq b$ ($S$ is free). The binary sum operation $\oplus$ which can be defined on these structures is simply the l.u.b of the two operands. We shall use the convention that discourse referents which are in capitals get only pluralities (i. e. sums) as values. If something is predicated of a plurality, the predication is interpreted distributively by default. Thus, suppose the constant *people* denotes a plurality of people in context $c$. then $sing(people)$ is an expression with a predicate which has a particular axiom $sing(X)\&X = x \oplus y \rightarrow sing(x)\&sing(y)$. This axiom can be applied recursively, until the atomic individuals are reached. For atomic individuals the value of such predicates is determined in the model explicitly. Thus, if we have a predication like in (33), we can immediately go to (34), i. e. distribute via a conditional.

(33)

| $E\ X$ |
|---|
| $E : predicate(X)$ |

(34)

| $E\ X$ | | |
|---|---|---|
| $x\ y$ | $\Rightarrow$ | $e_1,\ e_2$ |
| $X = x \oplus y$ | | $E = e_1 \oplus e_2$ |
| | | $e_1 : predicate(x)$ |
| | | $e_2 : predicate(y)$ |

To spell out the assumptions encoded in (33, 34) we should note that *predicate* is an event predicate. Moreover, we follow Krifka (1989) and assume his *Ereignis*homomorphism, i. e. that the structure of events mirrors the structure of the complex individuals which are the participants

[5]We shall adopt the common practice of calling events and states eventualities and will use one sort of variable for the two, $e$ or $E$, where the difference is not crucial.

in the event. Hence the distribution of the events parallel to the distribution over the parts of the complex individual. Similarly for states. As far as measure units are concerned, they were said to also form a complete atomic semi-lattice with a bottom element. This is a non-standard approach to measure functions and should be commented upon more extensively.

### 3.1.1 Measure functions.

A measure function[6] is a function with values which can be interpreted as a result of measurement which uses the measure function. The function $litres$, for example, maps quantities measurable in liters onto the set of real numbers. The function $bags$ maps quantities measurable in bags onto natural numbers. We need more abstract entities than natural or real numbers, however, for our purposes. Therefore we would like measure functions to be supplemented by measure quantities. We let a measure function map objects of measurement to mesure units via abstract measure quantities. Measure quantities can be defined as the results of measuring indexed by name of the function and the object which is measured. Then each abstract measure quantity provides a unique result of measurement. In other words, a measure quantity is a triple $< mq_1, mq_2, mq_3 >$ where the first coordinate is the name of the function, the second coordinate is the object measured and the third coordinate is the result of measurement, i. e. $mq_3 = mq_1(mq_2)$. Nouns like 'liters'introduce predicates which may thus be true of any plurality of measure units of the measure function $litres$, i. e. of measure quantities such that $mq_1 = litres$, and 'three liters' is a predicate true of measure quantities which measure three liters. The most common use of measure nouns is when they are modified by a noun denoting the measured stuff, and in such cases we are tempted to reinterpret such nouns as denoting the stuff itself. Three liters wine is any measure quantity $< mq_1, mq_2, mq_3 >$ with the second coordinate of $mq_2$ being a quantity of wine, and which has $mq_1 = litres$ and $mq_3 = 3$. But by metonymy three liters wine may be thought to be a quantity $X$ of wine such that $litres(X) = 3$. However, we still need that three liters wine is an object consisting of three-liter-quantities, since we say things like *Three liters are more than two liters*. Thus, we consider any representative of the equivalence class of measure quantities with $litres$ as the first coordinate and 3 as the third coordinate to be a quantity of three liters. A process of metonymy must allow the indefinite plural noun 'liters' to denote a sum of quantities of the corresponding measure function for liquids and simultaneously a sum of objects which are measured, i.e. a volume of a liquid. We shall use $litre$ to denote the indexing measure function of liter measure quantities in the sequel. This function will have values in abstract liter quantities, if applied to a volume of something. Thus, $litre(x) =< litre, x, n >$. We also postulate, that whenever $X = x \oplus y$ and $3d(liter(X)) = n$, then $n = 3d(liter(x)) \oplus 3d(liter(y))$, if the two objects $x, y$ are disjoint; $3d$ is the third coordinate of the triple. Similar principle is true of the measure quantities: $X = x \oplus y$, $x, y$ disjoint, and $3d(liter(X)) = n$ implies $M_X = m_x \oplus m_y$, where $M_X$, $m_x$ $m_y$ are measure quantities associated with the objects.

### 3.1.2 Measure nouns as predicates

To develop the idea of the metonymic use of bare measure nouns, we will simply leave it open in the lexicon which variable is abstracted on. The two representation possibilities of the semantics of the noun 'liters' can be then summed up in (35). Note that since only two discourse referents are listed as plural only they can be the basis of the plural predicate.

[6]For a discussion of the use of measure functions in the semantics of natural languages, see Krifka (1998)

(35)

| $M\ m_1\ m_2\ X\ z\ w$ |
|---|
| $M = m_1 \oplus m_2$ |
| $X = w \oplus z$ |
| $litre(w) = m_1\ litre(z) = m_2$ |

We now have the option of taking either $M$s or $X$s be the denotation of the noun, depending on the context. In a similar vein we may have a predicate which refers to $M$ or to $X$ as its abstracted variable. However, there is a problem with this approach as far as primary predication is concerned. Consider the sentences in (36).

(36) a. These are liters.

b. These are three liters.

c. *The wine is/are (three) liters.

Of these three, (36a) is appropriate in a context where someone is shown a measure vessel and gets the scale on the vessel explained; (36b) is also possible in this context. It can also be used in a context where someone is shown a flask of wine. But (36c) is not acceptable in this context. In fact it seems there is no context whatsoever where this sentence is acceptable. One explanation is that the metonymic process is restricted to some grammatical contexts, and is not available in the context of primary predication. The context we are interested in and where it is available is that of secondary predication.

We have to define what secondary predication is semantically. For the purposes of this paper we consider the semantic relation of predication to hold between a case-bearing category which is the complement of $Pr^0$ (the predicate) and its specifier $Pro$ (the subject). Given that agreement holds between the two elements, the interpretation of $Pro$ is a plural individual variable, if the predicate is defined for pluralities (what Kamp and Reyle call a complex individual; we use the term 'plurality discourse referent' equivalently). We assume that the default internal interpretation of plural secondary predication is simply a distributive universal quantification with substitution-like equalities. Thus, (37) denotes a set of complex individuals which are measured in liters.

(37)

| $X$ | | |
|---|---|---|
| $x\ y$ | $\Rightarrow$ | $M\ m_1\ m_2\ Y\ z\ w$ |
| $X = x \oplus y$ | | $M = m_1 \oplus m_2$ |
| | | $Y = w \oplus z$ |
| | | $litre(w) = m_1\ litre(z) = m_2$ |
| | | $x = w\ y = z$ |

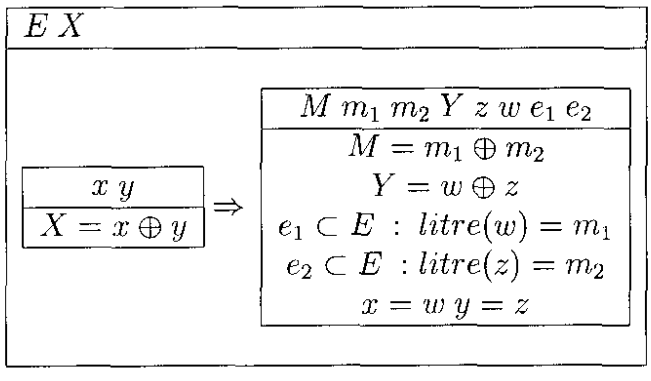
Since there are no further constraints on $X$ except that it is a complex individual, the predicate measure noun *can* be interpreted as denoting a predicate on individuals. We now have the $PrP$-internal interpretation of the secondary predication relation. Yet the semantics of the secondary predication in general is far from complete.

### 3.2 The Semantics of the PrP-adjunct.

We explore the idea of Susan Rothstein (Rothstein, 2000) that secondary predicates introduce a new eventuality (more like a state than like an event) which has at least one participant in common with the participants of the event of the modified clause. Moreover, the time course (run time) of the event in the main clause should be part of the time course of the eventuality introduced by the secondary predicate. The semantics of secondary predication falls thus in two parts: the internal semantics of the predicative adjunct and the external semantics relating the internal semantics to the semantics of the modified clause. We assume this external semantics to be associated with the syntactic construction and not with any particular lexical item. But it is certainly possible to chose an implementation which ties the external semantics to some syntactic feature in the predicative adjunct. We will not discuss this alternative here, since it is not the main problem of the paper.

The first part of Rothsteins idea concerns the eventuality which is associated with a complex individual, and (38) is its implementation.

(38)




The idea is that the abstract event or state of measurement of a complex individual consists of states of measurement of its parts. Note that we explicitly assign structure to the eventuality via individual states assigned to the parts of the complex individual using kind of homomorphism which follows the proposal of Krifka (1989), as noted earlier. We have to specify how this representation is integrated with the representation of the modified sentence. This is the second part of the interpretation of measure instrumental, the external part.

The interacting discourse objects are an eventuality and an individual. Given that the modified clause already introduced an eventuality we have to specify which relation holds between the eventuality of the main clause and the eventuality of the second predicate. According to Rothstein and a number of other researches the time course of the eventuality of the main clause should be within the time course of the secondary predication eventuality. The specifics of the proposal of Rothstein is that the two should form a sum. This treatment follows the proposal of Laserson on the nature of conjunction. A conjunction of two sentences denoting eventualities $e_1$ and $e_2$ denotes the sum $e$ of the two, i. e. $e = e_1 \oplus e_2$. We might assign the summing operation as the interpretation of the SP adjunct structure itself. Another condition of Rothstein, namely that the two eventualities should share one participant is automatically taken care of due to the fact that $Pro$ requires a controller within the discourse domain set up by the discourse representation of the main clause. Note that the distinction between the event of the primary and the event of the secondary predication is still preserved in the temporal condition.

Now, assume the representation of the main clause of (2a) without a secondary predicate in the instrumental is like in (39). We skip the temporal information for the moment, and employ a more explicit format.

(39)

| $e_m\ j\ v$ |
|---|
| $he(j)$ |
| $drink(e_m)$ |
| $agent(e_m) = j$ |
| $theme(e_m) = v$ |
| $wine(v)$ |

The format of the verbal information specifies the type of the situation which provides the object of measurement ($drink(e_m)$) and lists the agent and the theme of the event ($agent(e_m) = j$, $theme(e_m) = v$). Then the final representation of (2a) should be something like (40.)

(40)

| $E_\oplus\ E\ e_m\ j\ v\ X$ |
|---|
| $\tau(e_m) \subset \tau(E)$ |
| $E_\oplus = e_m \oplus E$ |
| $he(j)$ |
| $drink(e_m)$ |
| $agent(e_m) = j$ |
| $wine(v)$ |
| $theme(e_m) = v$ |
| $v = X$ |

| $x\ y$ |
|---|
| $X = x \oplus y$ |

$\Rightarrow$

| $M\ m_1\ m_2\ Y\ z\ w\ e_1\ e_2$ |
|---|
| $M = m_1 \oplus m_2$ |
| $Y = w \oplus z$ |
| $e_1 \subset E\ :\ litre(w) = m_1$ |
| $e_2 \subset E\ :\ litre(z) = m_2$ |
| $x = w\ y = z$ |

Here, $\tau(e_m) \subset \tau(E)$ means the time course of the first event is in the time course of the second event. As noted already, we do not necessarily specify the sort of the eventuality, partly to avoid the controversy over the status of measurements.

The difficult piece of the proposal is how to ensure that the correct controller is chosen. We might assume that as far as explicit arguments are concerned $Pro$ is controlled in accordance with general principles of control, i. e. its discourse referent is constrained by some discourse referent of a DP which c-commands it.

But for the proposal to function properly we should also admit non-standard cases of control where the referent is implicit, i. e. not realized overtly. This is not the kind of control which is characteristic of infinitives, though we have some similarities in the case of explicitly realized arguments, and we need a theory of implicit control.

## 4 Implicit control

### 4.1 Abduction as a mechanism of control

The theory of inferential interpretation which we propose is based on hypothetical inference.[7] Inference is a process by which consequences are derived from assumptions. The derivation

[7] Strigin (1999) contains more on the theory, cf. also Hobbs et al. (1993).

proceeds in steps which are justified by rules of inference. A rule of inference is based on a set of propositional patterns (premises) and a set of consequences. Whenever a set of propositions matches the assumption pattern, consequences corresponding to the rule can be drawn. An inference rule is sound if whenever the premises are true the consequences are also true, i. e. the consequences follow logically (in the sense of classical logic) from the assumptions (Genesereth and Nilsson, 1987). Deductive inference uses only sound rules.

The situation with hypothetical inference is different. If we have a set of propositions which matches the pattern of *consequences* of some sound rule, we could *assume* that the premises are satisfied, too. If there are alternative sets of premises which imply the consequences, we could speculate which of these are better assumptions given the task in question. This use of the rules of inference underlies the hypothetic or abductive inferencing. Suppose we take *modus ponens* in (41).

(41)

$$\frac{p \;\; p \rightarrow q}{q}$$

If we have $p$ and $p \rightarrow q$, *modus ponens* allows us to infer $q$. Now suppose that what we have is $q$ and use the rule in the reverse direction. We get $p$, if $p \rightarrow q$ obtains. We know that $p$ implies $q$ relative to $p \rightarrow q$ and we thus move to a smaller set of models in which not only $q$, but also $p$ holds. This can be a hasty decision, of course, and our assumptions may turn out to be wrong, given more knowledge. The rule *modus ponens* used backwards is therefore not sound. Moreover, we would probably want to specify what rules are usable, so as e. g. not to derive $q$ by hypothesizing it, since $q \rightarrow q$ always holds, or not to use conditionals with always false antecedents, since we want our hypothetically derived knowledge to be consistent. To do this we might select some $q$s as admissible hypotheses.

C. S. Peirce was the first to take abduction seriously. The following quotation (42) is taken from Peirce (1992).

(42) "If $\mu$ were true, $\pi, \pi\prime, \pi\prime\prime$ would follow as miscellaneous consequences.
But $\pi, \pi\prime, \pi\prime\prime$ are in fact true
$\therefore$ Provisionally, we may suppose that $\mu$ is true.

This kind of reasoning is often called *adopting a hypothesis for the sake of explanation of known facts*. The explanation is the *modus ponens*

If $\mu$ is true, $\pi, \pi\prime, \pi\prime\prime$ are true
$\mu$ is true
$\therefore \pi, \pi\prime, \pi\prime\prime$ are true."

A simple formalization of this idea Poole (1988) is as follows: a subset P of ground instances[8] of the set of some possible hypotheses $\Pi$ is an explanation for $\phi$, according to (43).

(43) $\Gamma \cup P$ *explains* $\phi$ if and only if
$(i)$ $P \cup \Gamma \models \phi$
$(ii)$ $P \cup \Gamma$ is consistent

[8]Ground instances are basically substitution instances of formulae in which all variables are replaced by constants.

The set of propositions $\Gamma$ represents our factual knowledge in the situation in which inference is done, $\phi$ is the observation to be explained, and P is the set of hypotheses available to us. Whenever hypotheses must be used each time they can be consistently used, we can speak of defaults. In this case we shall use the notation $\Delta$ for defaults. A formal theory with hypotheses $\Pi$ or defaults $\Delta$ and with the facts $\Gamma$ will also be sometimes called *abductive framework* $A = (\Gamma, \Pi)$ or $A = (\Gamma, \Delta)$.

Let us consider an example. Suppose we have a theory which tells us that birds fly as a rule, but that ostriches definitely do not fly. Call this abductive framework $A_{bird}$. It has a set of defaults, $\Delta$, which contains the rule-like assumption that birds fly. It is actually an open formula which gives rise to a hypothesis whenever all its variables are replaced by some constants. Such a substitution instance can be used as a hypothesis only if it is consistent, otherwise (43ii) is violated.

(44) $A_{birds} = (\Gamma, \Delta)$

$$\Delta = \left\{ bird(X) \rightarrow flies(X) \right\},$$

$$\Gamma = \left\{ \begin{array}{l} (\forall X)(ostrich(X) \rightarrow bird(X)), \\ (\forall X)(ostrich(X) \rightarrow \neg flies(X)), \\ ostrich(polly), \\ bird(tweety) \end{array} \right\}$$

This theory allows us to explain that *tweety* flies, but not that *polly* flies, because such an explanation would contradict the facts.

How to use abduction?

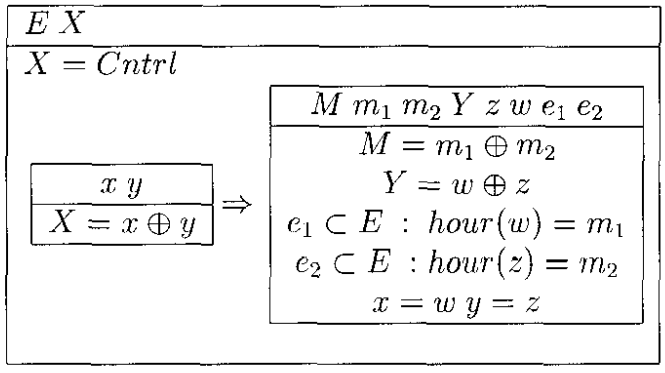
We construct an abductive framework which we then use as the mechanism of implicit control. To do this we specify a set of hypotheses to the effect what discourse referent is available as an implicit controller of $Pro$ in SP-$PrP$. Since we use this kind of control in a certain context, we include reference to the situation which provides the context. In our case this situation is satisfactorily identified by the eventuality $E$ provided by the SP. This is rendered by the notation $E$ :. this notation is intended to restrict the availability of the hypotheses to a certain context, i. e. we use contextually restricted reasoning.

(45) $A_{instr} = (\Gamma, \Pi)$

$$\Pi = \{E : X = y \;\&\; |||[_{PrP} \ldots DP_{instr} \ldots]|||(E, X)\}$$

The variable $X$ is the interpretation of $Pro$ in $|||[_{PrP} \ldots DP_{instr} \ldots]|||$, which is the interpretation of the secondary predication adjunct. We use $(E, X)$ to denote the occurrences of these arguments in the expression. Any contextually specified interpretation of the predication relation is obtained by abductively specifying the choice of the predication term $X$ in situation which introduced $E$. Any explanation hypothesis is then a substitution instance of $Cntrl$ which we use here instead of $y$ in $X = y$. Thus, if we choose the temporal coordinate $t$ as a substitution instance of $Cntrl$, we get the reading in (46). Choosing the implicit path referent gives us a path measurement.

(46)




Abduction will help us to use logical inference to narrow the range of available implicit referents for the measure instrumental in the next section.

### 4.2 Jakobsons theory of the Russian instrumental

Jakobson (1936) (reprinted in Jakobson (1984)) divides all case forms of Russian into two parts which he termed full case and peripheral case (Jakobson, 1984, p. 78).

> "'...I will call the I<nstrumental> and the D<ative> peripheral cases and the N<ominativ> and the A<ccusativ> full cases, and for the opposition between the two types I will use the designation **status-correlation** [*Stellungskorrelation*] in what follows. A **peripheral case** indicates that its referent occupies a **peripheral status** in the overall semantic content of the utterance, while a **full case** indicates nothing about such a status. A periphery presupposes a center; a peripheral case presupposes the **presence of a central point in the content of the utterance**, which the peripheral case helps determine... I would like to emphasize that what is specific to the peripheral cases is not that they indicate the presence of the two points in the utterance, but only that they render one peripheral with respect to the other."'

We will not attempt to explicate notions like *Stellungskorrelation* or *periphery*, but only use the partitioning. What is important in this partition is that the distinction is based not so much on the semantic properties of arguments, as on their status in the semantic representation, so that if they are important at all, then as a semantic or a pragmatic motivation for being classified in either way. It should be emphasized that according to Jakobson, if an argument gets *instr* instead of *nom* assigned, this assignment is made sometimes in accordance with the point of view of the speaker on the entire situation, i.e. the assignment can depend on the intention of the speaker to make some referent peripheral, if there is a choice. We therefore will assume that the speakers of Russian partition the situation characteristics represented by the semantic form of a sentence into two groups: the core and the periphery. Secondary predication characterises one part of the periphery, and logical inference plays a role in this.

### 4.3 Assigning instrumental

Since we noted that case assignment to a semantic argument can sometimes reflect intentions of the speaker, we may assume that case assignment can have both semantic and pragmatic aspects. We are therefore almost forced to consider case assignment of other cases in our theory of case assignment of the instrumental, though it is naturally impossible to consider all questions of case assignment in one paper. The reason is that an abductive explanation uses formulae which can be used to reason both ways: from an observation to its explanation to explain the observation,

and from its explanation to the prediction, but to a hypothetical prediction only. When treating case assignment in this inferential theory, we have something like an interpretation of the case form in this first case, whereas in the second case we have a case assignment rule. So case interpretation and case assignment are closely related in the theory of abductive interpretation.

We may assume that all the verb arguments are introduced into the semantic interpretation of a verb by means of argument relations like $argsubject(x, e)$, stating the requirement for a subject, or $argsubject(y, e)$, stating that an object is required by the verb. With the two relations we have therefore a very rough and underspecified characteristics of the semantic behavior of the verb which is valid for a large verb class of transitive verbs. These argument relations are treated as pendents to the syntactic subcategorisation frame of the verb. The status of the argument relation in the abductive framework associated with the verb is that of evidence which is to be explained. The computed syntactic relations are used as constraints and facts.

We will now assume that full cases in Jakobson's terminology are assigned by hypothetical reasoning basically to the terms of the argument relations. But the instrumental is a peripheral case, and is only assigned to non-arguments. Which means that we have a classification of the cases as part of the semantic-syntactic interface, perhaps as in (47).

(47) $A_{case} = (\Gamma, \Delta)$

$$\Gamma = \left\{ \begin{array}{l} \text{NOM}(x) \rightarrow fullcase(x) \\ \text{ACC}(x) \rightarrow fullcase(x) \\ argsubject(x, e) \rightarrow \text{NOM}(x) \\ argobject(x, e) \rightarrow \text{ACC}(x) \\ fullcase(x) \ \& \ \sim fullcase(x) \rightarrow \bot \end{array} \right\}$$

$$\Delta = \left\{ \begin{array}{l} \sim fullcase(x) \\ \sim fullcase(x) \rightarrow \text{INSTR}(x) \end{array} \right\}$$

This is a small case assignment theory. It works as follows. Both NOM and ACC are full cases represented as predicates based on feature sets. The classification of these predicates is a fact, i. e. it cannot be dropped or changed in the task of explanation. But we also need a default to the effect that full cases are only those which are explicitly classified as such. To do this we hypothesize that all the cases are peripheral, unless something contradicts it. The prefix $\sim$ here is a kind of negation, because the predicates $fullcase(x)$ and $\sim fullcase(x)$ are incompatible, as stated in $fullcase(x)$ & $\sim fullcase(x) \rightarrow \bot$, i. e. their conjunction implies the (always) false proposition $\bot$. But it is a special kind of negation, called *negation as failure* or NAF [9]. Moreover, it is an abductive formulation of NAF (Kakas et al., 1995). It functions as a default and is always applied, unless there is an explicit positive case. Now the case $fullcase(x)$ & $\sim$ $fullcase(x)$ can never occur, because $\sim fullcase(x)$ is only a hypothesis which cannot be applied when there is a positive statement, i. e. a full case is present. Furthermore, we do not want to exclude the state of things when there are other peripheral cases, and therefore we assume that $\sim fullcase(x) \rightarrow \text{INSTR}(x)$ is only a default, too. What we now achieved is that the individual arguments $x$ of $argsubject(x, e)$ or an $argobject(x, e)$ never require a realization in the instrumental. It could be that this requirement is too strong for Russian, but we leave it at that here.

According to this theory, all the discourse referents $x$ which are introduced in the situation which are not $argsubject(x, e)$ or $argobject(x, e)$ can in principle occur in the instrumental, e. g. a

[9] Cf. Clark (1978), Nilsson and Maluszyński (1990).

means of transport referent in a situation which allows for some means of transport, a path referent, a referent which denotes an instrument, a temporal specification, etc.. The hypothetical character of the case assignment rule does not require that they must occur in the instrumental, however. There may be other case assignment rules which compete.

Thus, the assumption that the dative in Russian is a structural case of the indirect object is plausible, cf. Bailyn (1995), but Jakobson considered the dative also to be a peripheral case. What are then the ways to choose between the two?

It can be assumed that the case assignment of two different peripheral cases is based on the specificity criterion. Anything more specific that pure predication about a peripheral individual will have a realization different from the instrumental, if Russian provides one. These specific properties are additional semantic constraints and must then be associated e. g. with the dative or with some preposition. One linguistically minded application of the specificity criterion as a criterion for the choice of hypotheses is to be found in Strigin (1998). With this addition the rules for the assignment of the instrumental would be like in (48), $R(y, e)$ ranges over the relations in the situation description.

(48) $A_{case} = (\emptyset, \Delta)$

$$\Delta = \left\{ R(y,e) \,\&\, y = x \rightarrow (\sim fullcase(x) \rightarrow \text{INSTR}(x)) \right\}$$

Any more specific mentioning of a relation would override this assignment, so if dative is associated with some additional information, it will win by specificity. An alternative to this could be to assign a subset of discourse referents to the dative outright, on the basis on some explicit property, and make these assignments facts. This would block both the assignment of the instrumental, and the assignment of the status of a prepositional object, but allow for the dative assignment to the indirect object of the verb.

Note that it is actually the empty pronominal *Pro* which gets instrumental syntactically assigned (or checked) by the $Pr^0$, and not the discourse referent which requires it according to the case assignment rules given above. Since there are no positions which check instrumental within the structure of the modified sentences, it gets checked indirectly via $Pro$.

It would be an insurmountable task to discuss both the principles of assignment of all the possible peripheral cases and those of the prepositions. Therefore we will leave the question open here, though we may remark that we would expect the solution be based on the specificity criterion.

The position of the paper is that only peripheral implicit arguments are available as implicit controllers. But since full case arguments are available via syntactically based standard control, we have exactly the cleavage which excludes the indirect object and the prepositional phrases. However, if we accept our assumption that the arguments of the verb receive full cases, then it is impossible to explain, why they sometimes receive dative instead of the accusative. The complex predication structure cases like (30) is not observed in Russian, since the two quasi-accusatives are distinct case forms, the accusative for the argument corresponding to *the book* and the dative for the argument corresponding to *Mary*. But we might modify the theory of Jakobson in the direction of postulating two functions of dative: the case for the third argument and the case for the adjuncts. Then the dative is chosen on the basis of some more specific semantic constraints which override the instrumental, if the dative is the adjunct case, and it does not qualify as a controller via syntactically licensed control. Alternately, all the DPs in the dative can probably be analyzed as peripheral arguments, so specificity accounts for all occurrences of the dative in opposition to the instrumental. This question requires more research.

But can we have double instrumental? Since instrumental is assigned to peripheral discourse referents, there should be in principle no problem with that. However, in general measure instrumental does not refer to another instrumental via implicit control. If we assume that the standard realization of the instrument is in instrumental, the second, measure instrumental should be possible, but is not. Similarly, if path is realized by an instrumental DP, it should be possible to use this referent as a measure base, but it it impossible, cf (49) and (50).

(49) *Oni stučali molotkami des'atkami
They knock-past-pl hammer-instr-pl ten-instr-pl
They knocked with the hammers by tens/in tens

(50) *Oni šli dorogami sotn'ami
They go-past-pl road-instr-pl hundred-instr-pl
They went hundreds of roads

We think that this is a matter of pragmatically caused competition between ways of expressing things. Our motivation is due to the observation that the intended meaning is expressed by the numeral measure phrases in the instrumental, cf. (51) and (52).

(51) Oni stučali [des'atkami molotkov]$_{instr}$
They knock-past-pl ten-inst-pl hammer-gen-pl
They knocked with the hammers by tens/in tens

(52) *Oni šli [ sotn'ami dorog]$_{instr}$
They go-past-pl hundred-instr-pl road-gen-pl
They went hundreds of roads

## 5 Further applications

There are some interesting problems with the temporal use of the instrumental case. The most interesting one from the current point of view is that of a certain class of singular temporal nouns in the instrumental. We call these nouns distributive temporal predicates, for reasons which will immediately become obvious.

A noun like *leto* (summer) is predicated of a temporal discourse referent. We consider this referent to be the reference time of the situation, i.e. a temporal anchor of the situation.

(53) Letom on bolel
Summer-instr he ill
He was ill this summer/in summer

That the sentence is acceptable is puzzling on the assumption that we have a measure instrumental here, too. It might be expected that some rather similar temporal uses of nouns denoting temporal measure units in the instrumental singular are impossible, and indeed, this is so.

(54) *Časom on čital
Hour-instr he read
He was reading for an hour/this hour

What is the the specifics of these predicates? To determine this we need some comparisons with other temporal adverbial elements.

If the temporal measure is used in the accusative singular, the sentence is OK with the durative reading of the $DP_{acc}$. But the plural of the accusative temporal unit phrases are impossible, cf. (56), unless we use a numeric specification of the time, in which case the measure noun modifies the numeral in the accusative, cf. (57).

(55) Čas on čital
Hour-sg-acc he read
He was reading/read for an hour

(56) *Časy on čital
Hour-pl-acc he read
He was reading/read for hours

(57) P'at' časov on čital
Five-acc hour-gen-pl he read
He was reading/read for 5 hours

As was mentioned in the introduction, measure units in plural in the instrumental are OK, on the contrary, *unless* used with a numeric specification. Let us assume that a sentence refers to a situation, if used in an assertion, which is classified as belonging to the situation type characterized by the sentence. Then the accusative of a numeral with the unit specification in the genitive gives the duration of the event(s) in the situation. The measure instrumental, on the contrary, only measures something. The anchoring use of the temporal distributive singular predicates anchors the situation temporally, but is not really durative, cf. (58).

(58) a. Letom on bolel p'at' dnej
Summer-instr-sg he *ill* five-acc day-gen-pl
He was ill two days this summer/in summer

b. *Sem' dnej on bolel dva dn'a
Seven-acc day-gen-pl he ill five-acc-sg day-gen-pl
He was ill five days seven days

The intended interpretation of (58b) - *he was ill for five days in seven days* - is not available. Duratives proper are ruled out, if doubled.

Consider the following line of reasoning suggested to the authors by Manfred Krifka. The accusative case is used to mark arguments which are incremental themes. In this function it 'measures out' the event, using th terminology of Tenny (1994) producing at least in English and in German a telic predicate by delimiting the event. The temporal use of the accusative picks up this semantic function in the temporal domain. The bare plural cannot express the delimitation, due to its semantic property of divisivity, hence (56).

The case with distributive temporal predicates in singular is ambivalent. Thus, e. g. *den'* (day), can be used in two ways, as a temporal anchor in the instrumental and as a durative singular temporal predicate in the accusative. It can also be used as a plural genitive in the numeral temporal phrase base on the accusative. The first two uses may be teased apart, formally. Only in the first use, which requires the instrumental, such words cannot be modified by *celyj* (whole).

(59) on čital (*celym) dnem
He read (*whole-instr) day-instr
He was reading (*the whole day) at some time of the day

(60) on čital (celyj) den'
He read (whole-acc) day-acc
He was reading for a ( whole) day

Assuming that the adjective constructs a delimiting adverbial of sorts, the instrumental becomes unavailable, because this is the function of the accusative. Our inferential theory of case assignment codes that whatever appears in the full case cannot appear in the instrumental. This implies a somewhat more precise picture of the periphery, of course.

We also obtain the authentic measure instrumental of distributive predicate, which admits of *celyj*, cf. (61), but this only supports the intuition that *celyj den'* in (60) is a measure unit.

(61) on čital (celymi) dn'ami
He read (whole-instr) day-instr-pl
He was reading (whole) days on end

So what do we have now? We proposed that singular $DP_{instr}$ in (59) are situation restrictors, i. e. anchors. The accusative is then the case which is reserved for duratives, and duratives do not anchor situations, but simply specify the duration of the events in the situation. In other words they are pure modifiers and, presumably, adjuncts.

There is a substantial semantic difference between the two kinds of temporal phrases. The ones we call distributive predicates are really divisive. Any part of summer is summer. Units are quantized, e. g. no part of a week is a week. The modifier *celyj* (whole) disallows distribution, since no part of a whole day is the whole day. The interesting question is why the distributivity of the predicate is required in the anchoring use[10]. We would like to assume that the anchoring function of temporal predicates (i. e. their functioning as restrictors) is to facilitate a unique identification of the temporal location of the situation in time, and time is divisive, if unmeasured. Then the anchoring function requires the preservation of the potential for distributivity, so temporal units in the instrumental singular are excluded in the anchoring use.

However, one may think that if temporal units are pluralised, they should acquire the ability to distribute, if the theory of plural in Krifka (1989) is assumed. This seems to be born out at first, because temporal unit nouns in plural can be used in free instrumental. The plural creates cumulative predicates, so distribution is allowed as an option of the interpretation of predication with such predicates.

(62) Časami on čital
Hour-instr he read
He was reading for hours on end

[10]The distributivity/divisivity seems to be in general a property of the class of temporal adverbials which Kamp and Reyle (1993) call *locating adverbials*, e. g. *on Sunday*, *on May, 27*, because every part of Sunday is still Sunday and every part of May, 27 is May, 27. But Kamp and Reyle do not comment on this property. Locating adverbials are called temporal anchors in this paper.

What we have here is our measure instrumental. Is there then a difference between temporal singular distributive predicates and temporal measure instrumental?

It seems there is. A plural temporal unit in the measure instrumental is best regarded as predicated of the event or state which characterizes the situation, and not of its reference time. To be more precise, the distributive predicates are predicated of the time course of the whole complex situation and locate it in time, the measure instrumental predicate is predicated of the time course of the event introduced by the verb and characterizes it as measured in some way.

This can be easily shown. Perfectivizing the verb immediately blocks the interpretation with the plural unit, but not with distributive temporal predicates in singular.

(63) *Časami on pročital knigu
Hour-instr he read the book
He read the book in hours

(64) Večerom on pročital knigu
Evening-instr he read the book
He read the book (to the end) in the evening

The complex [*event : state after it*] which is characteristic of Russian perfectivization is not distributive. It should be, however, because of the homomorphic requirement associated with the distributive nature of the temporal referent of *časami* (hours-instr), as was discussed in section 37. This homomorphism is the cornerstone of the theory in Krifka (1992), and was adopted by us, too. No homomorphism is required by the temporal noun anchors, which are singular and distribute on conceptual demand, and not as a matter of grammar, since they refer only to the temporal course of the situation and not to temporal characteristics of its constituent parts, like events, etc.. Thus, (65) is OK, (66) is out, but if we let *dvaždy* (twice) have scope over *nedel'ami* (weeks-instr), the sentence becomes OK with a kind of durative reading for *nedel'ami*,(67).

(65) Letom on dvaždy bolel
Summer-instr-sg he twice ill
He was twice ill this summer/in summer

(66) *Nedel'ami on dvaždy bolel
Weeks-instr-pl he twice ill-past
For weeks he was twice ill

(67) On dvaždy bolel nedel'ami
He twice ill-past weeks-instr-pl
He was twice ill for weeks.

The same operation can be done on *Letom* in (65), cf.(68).

(68) On dvaždy bolel letom
He twice ill-past summer-instr-sg
He was twice ill in summer.

The interpretation is however that he was twice ill in summer (different summers perhaps), but not that he was twice ill during the whole summer (different or same), whereas (67) requires that he be ill some weeks every time. The relative interpretation is a matter of scope, but the core interpretation remains still the same: *letom* locates something like a time course of a situation, and measure instrumental of unit phrases measures some other temporal referent, perhaps the time course of the event. In fact temporal units in plural instrumental can measure the event by reference to time in different syntactic positions, cf. (69), which is parallel to (9).

(69) Vrem'a tratili časami
Time-acc squander-3pers-pl hour-pl-instr
Time was squandered/they squandered time by the hours

We cautiously conclude that a distributive temporal predicate characterizes the reference time of the situation, and that this time is not identical with the time of the event of the situation. The durative meaning is associated with the accusative and is predicated on the event argument of the situation, whereas temporal measure instrumental measures the event in terms of some of its properties which are associated either with one of its participants or with its temporal course.

## 6 Conclusion

We proposed a syntax and a semantics of the measure instrumental. We treated plural DPs denoting units of measurement in instrumental as secondary predicates. Syntactically they are adjuncts with a specific structure: a functional category of predicates ($PredP$) constituting a small clause of sorts, as proposed for the English adjectival secondary predication by Bowers and for the Russian by Bailyn. We also provided a semantics for this use. Under this treatment a NP in the instrumental is a secondary distributive predicate with the intrinsic meaning "more than one" provided by the plural. This accounts for the lack of singular in this use. The secondary predicate introduces an event which is distributive due to the plural noun and the $\theta$-role homomorphism proposed in Krifka (1998). The event of the small clause also measures the event introduced by the main clause, hence requires it to be distributive. The distribution takes place because the event of the main clause and the event introduced by the secondary predicate small clause share a participant, due to the control mechanism involved in the interpretation of the empty pronominal $Pro$, which is the subject of the small clause $PredP$. We suggested, similar to Krifka, that measuring the event is semantically lowered to measuring any entity in the core part of the event. In other words, measuring it gives a characterization of an event in terms of its participants. We assumed that the semantics also involves the notion of inferential interpretation of an underspecified semantic structure, in our case of $Pro$. The interpretation leading to the measure instrumental consists in (a) employing the intrinsic meaning of the plural (more than one) to make an assertion and (b) to weakly measure the event in terms of its homomorphic characteristic discourse objects, if measuring can be done, where the objects measured are inferred with the help of abductive inference. The interpretation therefore specifies what the basis of measurement for the event distribution is in terms of the core discourse referents (i.e. what is measured), and is used to assign the instrumental case. The discourse referent which is measured is syntactically constrained, so we have reasons to believe that this is indeed a secondary predicate in terms of the model of predicative structure of Bowers and Bailyn. The theory we proposed allowed us to draw a distinction to the temporal use of instrumental in (70).

(70) Letom on často bolel
Summer-instr he often be-ill
In summer he was often ill

The distinction we made referred to a different use of the instrumental as a temporal anchor of the situation which is takes to verify the sentence. The upshot of the treatment is the conclusion that the model of measure instrumental which takes it to be a $PredP$-adjunct possesses explanatory adequacy for a number of diverse phenomena. Thus, we have argued that if secondary predicates are adjunct small clauses one use of Russian instrumental can be well accommodated.

# A Appendix. The Semantic Basics of DRT

For the sake of better integration of the results of this work into general semantic theory we present a small portion of the discourse representation theory, DRT. The main references are Kamp and Reyle (1993), Kamp and Rossdeutscher (1994), Cooper et al. (1994), Asher (1993). The exposition here follows mostly Cooper et al. (1994). The definition of the part of a language of DRT used in this paper is given in (71). In general we let small variables in the definitions denote both simple and complex DRs, if it makes no difference in the context.

(71) The vocabulary of a simple DRS language consists of
- (i) a set $Cons$ of individual constants, e. g. $now$
- (ii) a set $Ref$ of five different sorts of discourse referents
  $Ind = \{x_1 \ldots x_n, X_1 \ldots X_n\}$, a set of individual and group or plurality referents
  $Time = \{t_1 \ldots t_n\}$, a set of referents for times
  $Event = \{e_1 \ldots e_n, E_1 \ldots E_n\}$, a set of event referents
  $State = \{s_1 \ldots s_n, S_1 \ldots S_n\}$, a set of state referents
  $Units = \{m_1 \ldots m_n, M_1 \ldots M_n\}$, a set of abstract units of measurement
- (iii) a set $Pred$ of predicate constants including $\subset$, $\subseteq$
- (iv) a set $Func$ of function symbols, e. g. $\tau$, $\oplus$, $agent$, $theme$
- (v) a set $Sym$ of logical symbols, e. g. $=, \Rightarrow$

The set of terms is $Terms = \{Const \cup Ref \cup \{t | t = f^n(t_1 \ldots t_n\}\}$
where $f$ is a function symbol of arity $n$, and $t_i$ a term.

A discourse representation structure (DRS) is essentially a set of discourse individuals (the universe of DRS) with a set of conditions on them which are required to hold in a situation modeled.

(72) DRSs and DRS conditions are usually defined by simultaneous recursion.
- (i) if $U$ is a (possibly empty) set of discourse referents $x_i \in Ref$,
  $CON$ a (possibly empty) set of conditions $con_j$,
  then $< U, CON >$ is a DRS and $U$ is its universe
- (ii) if $x_i, \ldots x_j \in Ref$, then $x_i = x_j$ is a condition
- (iii) if $c_i \in Const$ and $x_j \in Ref$, then $c_i = x_j$ is a condition
- (iv) if $P$ is an n-place relation name in $Pred$ and $t_1, \ldots t_n \in Terms$,
  then $P(t_1, \ldots, t_n)$ is a condition
- (v) if $P$ is an n-place event relation name in $Pred$, and $e, t_1, \ldots t_n \in Terms$,
  then $e : P(t_1, \ldots, t_n)$ is a condition
- (vi) if $x$, $x_1 \ldots x_n \subseteq Ref$, then $x = x_1 \oplus x_a$, $f^n(x_1, \ldots, x_n) = x$ are conditions
- (vii) if $K_1$ and $K_2$ are DRSs, then $K_1 \Rightarrow K_2$ is a condition

DRS are defined in (i), atomic conditions in (ii)-(vi). Complex conditions in (vii). There are more logical symbols used in the examples which do not occur in the definition of a condition, &, $\sim$, $\perp$ and $\rightarrow$. They are not needed in the standard development of the DRT. We use them in their standard logical meaning or explain them only to compute the semantic representations and do not want to use any of the deduction rules of the DRT for this purpose. The move is harmless, but since we do not attempt to integrate the logical terminology, we simply take care that standard modell-theoretical notions of DRT are defined on DRS which contain the results of abductive inferencing and no expressions containing & and $\rightarrow$.

In the model theory of this fragment of DRT we represent the world by a total model $\mathcal{M} =< \mathcal{U}, \Im >$ with $\mathcal{U}$ the domain of individuals of $\mathcal{M}$ and $\Im$ the interpretation function of $\mathcal{M}$, which maps constants in $Const$ into elements of $\mathcal{U}$, n-ary function names into the set of functions $\wp(\mathcal{U}^n) \rightarrow \mathcal{U}$ and n-ary relation names in $Pred$ into elements of the the set $\wp(\mathcal{U}^n)$. A total model evaluates all sentences of the language we model as either true or false. We want a discourse representation structure (DRS) $K =< U, CON >$ to come out true in $\mathcal{M}$, if its discourse referents $u \in U$ are mapped into the elements of $\mathcal{U}$ in such a way that under this mapping all the conditions $con_i \in CON_K$ come out true in $\mathcal{M}$. Let $g\,[y]\,f$ be an extension $g$ of $f$, i. e. a function such that $Dom(g) = Dom(f) \cup y$

(73) (i) $h \models_{\mathcal{M},g} < U, CON >$ iff $h\,[U]\,g$ and for all $con_i \in CON$ : $\models_{\mathcal{M},h} con_i$

(ii) $\models_{\mathcal{M},g} x_i = x_j$ iff $g(x_i) = g(x_j)$

(iii) $\models_{\mathcal{M},g} c_i = x$ iff $\Im(c_i) = g(x)$

(iv) $\models_{\mathcal{M},g} P(t_1, \ldots, t_n)$ iff $< g(t_1), \ldots, g(t_n) > \in \Im(P)$

(v) $\models_{\mathcal{M},g} e : P(t_1, \ldots, t_n)$ iff $< g(e), g(t_1), \ldots, g(t_n) > \in \Im(P)$

(vi) $\models_{\mathcal{M},g} X = x_1 \oplus x_2$ iff $g(X) = \bigvee\{g(x_1), g(x_2)\}$

(vii) $\models_{\mathcal{M},g} f^n(t_1, \ldots, t_n) = x$ iff $\Im(f^n)(g(t_1), \ldots, g(t_n)) = g(x)$

(viii) $\models_{\mathcal{M},g} (K_1 \Rightarrow K_2)$ iff for all $h$ such that $h \models_{\mathcal{M}} K_1$ there exists a $k$ such that $k \models_{\mathcal{M},h} K_2$

A mapping from $K$ to $\mathcal{M}$ like in (73) is called *a verifying embedding of $K$ into $\mathcal{M}$.*

(74) A DRS $K$ is true in a model $\mathcal{M}$ with respect to an assignment $g$ iff there *exists* a verifying embedding $h$ for $K$ in $\mathcal{M}$ with respect to $g$. In mathematical terms, $\models_{\mathcal{M},g} K$ iff $h \models_{\mathcal{M},g} K$.

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# Semantic Constraints on Case Assignment in Secondary Adjectival Predicates in Russian*

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## Abstract

Adjectival secondary predicates can enter into two Case frames in Russian, the agreeing form and the Instrumental. The paper argues that these Case frames go together with two syntactic positions in the clause which are correlated with two different interpretations, the true depictive and the temporally restricted reading, respectively. The availability of the two readings depends on the boundedness of the secondary predicate. Only bounded predicates can enter into both Case frames and only partially non-bounded predicates can appear in the Instrumental. The paper therefore argues that the pertinent two-way SL/IL-contrast is to be replaced by a three-way distinction in terms of boundedness. The paper outlines the syntax and semantics of the true depictive and the temporally restricted interpretation and discusses how adjectival secondary predicates whose salient properties involve a cotemporary interpretation with the matrix predicate and a control relation of an individual argument, differ from temporal adjuncts as well as from non-finite clauses.

## 1 Introduction

In recent years, work on the much discussed Stage-level/Individual-level contrast has accumulated which argues convincingly that the pertinent distinction should not be handled in terms of a difference in the argument structure of the respective predicates (cf. Higginbotham & Ramchand 1996, Jäger 1999). Nevertheless, the distinction is real and is relevant in one way or other in various environments. One such environment is the depictive use of adjectival secondary predicates. Already Rapoport (1991) noted that only SL-predicates can be depictives, as is illustrated in (1).

(1) a. Ronnie bought the dog sick
b.* Ronnie bought the dog intelligent

In this paper, I argue that the distribution and interpretation of adjectival secondary predicates in Russian implies that, at least in the realm of adjectival predicates, instead of a two way distinction a three way distinction is called for, namely one between bounded, partially non-bounded and unbounded predicates.

### 1.1 Case (Non-) Agreement

In Russian, adjectival predicates agree with the NP they are predicated of in gender and number. Depending on their own meaning and on the meaning of the sentence they are contained in, they can also agree with the case of their antecedent NP, or appear in a distinct non-agreeing case, namely the Instrumental, as is illustrated in (2)[1].

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1 There are two exceptions to this generalization: *odin* (alone) and *sam* (self) always agree with their

(2) a. *Ivan rabotajet golyj*
John works naked-NOM

b. *Ivan rabotajet golym*
John works naked-INS

In this paper, I will show that only bounded adjectival predicates can appear in either form, with the agreeing form (in short NOM) being the unmarked form and the Instrumental occurring when additional conditions obtain, whereas non-bounded adjectival predicates can only appear in the Instrumental form. I will also show that the interpretation that these predicates receive systematically correlates with their syntactic position in the clause and the Case they are licensed with, as is summarized in (5).

## 1.2 1.2 Types of Modification Relations

Adjectival predicates can in principle enter into three types of modification relations, which I call the circumstantial reading, the pure depictive and the temporally restricted reading. In the circumstantial use, which is illustrated in (3), the secondary predicate describes the circumstances in which the assertion formed by the remainder of the clause holds. I propose that the adjective in the circumstantial reading is interpreted as forming the restriction of an unselective operator, whose nuclear scope is then provided by the rest of the clause, as is indicated in the translations in (3).

(3) a. *Golodnyj, on vernulsja domoj*
Hungry-NOM he returned home
"When he was hungry, he returned home"

b. *Sladkij etot caj nevkusnyj*
Sweet this tea not-good
"If it is sweet, this tea is not good"

c. *On i spjacij ne mog zabyt' etogo*
He even sleeping not could forget this
"Even when he was sleeping he could not forget this"

The depictive reading and the temporally restricted reading are illustrated in (4a) and (4b), respectively. In (4a), the adjective describes the subject at the time it is engaged in the event expressed by the main verb. I propose that in the depictive use, the adjective expresses an independent event and that the clause is interpreted as a (logical) conjunction of two (independent) assertions.

(4) a. *On ženilsja na nej pjanyj*
He married her drunk-NOM
"He married her (at time t) and he was drunk (at t)"

b. *On ženilsja na nej molodym*
He married her young-INS
"When he married her, he was young"

---

antecedent in case.

In (4b), where it appears in the Instrumental, the adjective receives a rather different interpretation from the one in (4a). Here the adjective, in contrast to the circumstantial reading, forms the nuclear scope of an unselective (temporal) operator, whose restriction is provided by the remainder of the clause. In the remainder of the paper, I will only be concerned with the distinction between the depictive interpretation and the temporally restricted interpretation of adjectival predicates.

(5)

| reading | circumstantial | pure depictive | temporally restricted |
|---|---|---|---|
| Case | NOM | NOM | INS |
| Interpretation | C-domain | I-domain | V-domain |

The paper is organized in the following way. In Section 2, I will discuss the differences in interpretation and distribution between the long form and the short form of the adjective. In Section 3, I will define the notion of a bounded predicate and discuss the behavior of bounded and non-bounded predicates with respect to the Case forms they can be realized with. In Section 4, I discuss the factors that determine the choice between agreeing form and Instrumental with bounded predicates. In Section 5, I discuss the different semantic properties of the true depictive and the temporally restricted reading and provide an account that relates these differences to differences in the syntactic licensing of these readings.

## 2 Long Form/Short Form of the Adjective

In this section, I will show that the secondary predicates in (2) –(4) above are truly APs and rule out the possibility of analyzing them as "hidden" NPs. It is necessary to make this argument for the following reason.

Modern Russian has two types of adjectives, the so-called long form (lf) and the so-called short form (sf). The long form has additional morphology and appears in attributive position, where the short form is impossible, as is shown in (6).

(6) a. *umnaja devuska*
smart-lf girl

b.* *umna devuska*
smart-sf girl

However, as is shown in (7) both forms are possible in predicative position. Babby (1973, 1987, 1999) and Bailyn (1994) provide convincing arguments that the long form in predicative position is actually contained in an NP with a null nominal head, as is illustrated in (8). Bailyn (1994) shows that (7a) and (7b) differ slightly in their meaning as well. Whereas (7a) means the girl is smart in absolute terms, (7b) asserts that the girl is smart compared to other members of her class, i.e., she is smart for a girl or a woman. Bailyn (1994) argues that this semantic difference can be nicely coupled with the presence of an empty nominal in (7b), which provides the reference class with respect to which the predication expressed by the adjective is made.

(7) a. *Devuska umna*
girl smart-sf 'the girl is smart'

b. *Devuska umnaja*
girl smart-lf

(8) Devuska [$_{NP}$ [$_{AP}$ umnaja] N ]

As (9) shows only the long form is possible, when the adjective is used as a secondary predicate. This is surprising given the facts in (7) and the question arises whether the secondary predicate in sentences like (9) really is an AP or had better be analyzed as an empty headed NP containing an adjective as modifier. In this way, the contrast in (9) could be related to the constrast in (6). In other words, the question arises whether (9) really means something like 'he came home as a hungry person'?

(9) *On vernulsja domoj golodnyj/*goloden*
He returned home hungry-NOM/hungry-sf

The answer is no and the argument is fairly simple. Note that an NP in the very same position as the adjective *hungry* in (9) can only appear in the Instrumental, never in the argeeing form, as is shown in (10). If *golodnyj* in (9) really were an NP then is it unclear why it can be spelled out with an agreeing Case, namely Nominative, which is the preferred option in (9).

(10) *On vernulsja s vojny oficerom/ *oficer*
He returned from the war an-officer-INS/*NOM

Thus it follows that the secondary predicate in structures like (9) is an AP. On the other hand, the possibility remains that at least adjectival secondary predicates in the Instrumental are hidden NPs. Though a split along these lines is a highly unlikely state of affairs, we would like to rule it out if possible. This possibility can be ruled out with the help of certain nouns which can only appear with the short form of the adjective in predicative position. These are nouns which are not members of a class by virtue of being unique. One such noun is 'kosmos' which does not admit any long form in predicative position, as is illustrated in (11a).

(11) a. *Kosmos neobitaem/??neobitaemyj/*neobitaemym*
the universe uninhabited

b. *Kosmos mne nravitsja nebitaemym/*neobitaem*
the universe me pleases uninhabited

As (11b) shows the same adjective applied to the noun *Kosmos* as a secondary predicate can appear in the Instrumental while the short form is ungrammatical. Again, if the adjective in the Instrumental were part of an NP, then it remains unclear why the long form should be possible here. Thus we can safely conclude that adjectival predicates both in the agreeing form and in the Instrumental are true APs.

The question remains, though, why adjectival secondary predicates, contrary to primary adjectival predicates, cannot appear in the short form. In order to explain the distribution of the short and the long form in Russian, Bailyn (1994) proposes that the long form morphology heads the functional category ModP (for Modifier Phrase). What unites the attributive use of the adjective and the use as secondary predicate is the fact, that in both cases the adjective modifies another category, an NP and a VP respectively.

This is certainly an interesting proposal, though it is unclear whether the semantic relation of modification needs to be expressed by a syntactic head rather than being merely represented as syntactic adjunction. Thus, I will leave this question open for future research.

## 3 Semantic Constraints on Case assignment

In this section, I will explicate one factor that determines which of the two forms, the agreeing form or the Instrumental, is appropriate in a given context. It is the semantic type of the adjective itself which restricts the availability of the two forms in the following way. Only adjectives that denote a temporary state can appear in the agreeing form. Being drunk is a paradigm case of a temporary state. As (12a) and (12b) show, an adjective like *drunk* can appear in both forms, whereas an adjective like *young*, which is generally thought of as denoting a property, is only good in the Instrumental.

(12) a. *On ženilsja na nej pjanyj/pjanym*
He married her drunk-NOM/drunk-INS
b. *On ženilsja na nej molodym/??molodoj*
He married her young-INS/young-NOM

This immediately raises the question of how we can define a temporary state? Afterall, being young is not a permanent property like being intelligent or having blue eyes. It is less temporary than being drunk, for sure, but it denotes a property that is being lost in the second or third decade in one's life. Also, the ripeness of a fruit is a relatively short temporary state (it lasts a couple of days), whereas the sickness of a person can last for several weeks. Nevertheless, *ripe* can only appear in the Instrumental, whereas *sick* can be used in its agreeing form (cf. (13)). I will define a temporary state as given in (14).

(13) a. *On sobral slivy spelymi/* spelye*
He plucked the plums ripe-INS/ripe-AKK

b. *Ona vstretila jego bol'nogo/bol'nym*
She met him sick-AKK/sick-INS

(14) An adjectival predicate P denotes a temporary state (i.e., is bounded), if P is both preceded and followed by a state the can be characterized by *not P* in the language system

Note that it is crucial in (14) to refer to the language system. While it is true that when a fruit is rotten it is not the case that it is ripe, it is not strictly speaking non-ripe. That is to say, the past ripe state of a fruit is not conceptualized as non-ripe. A good test for how adjectives are categorized with respect to this property are the so-called phase quantifiers and their negations (cf. Löbner (1989). *Noch nicht P* (not yet P) requires that P is preceded by a state characterizable as non-P. *Nicht mehr P* (not P anymore) requires that P is followed by a state characterizable as non-P. The Russian equivalences are *ne...jesce* and *ne...uze*.

(15) a. *Kogda ja sobral slivy, oni ješče/ *uze byli ne spelyje*
When I plugged the plum, it yet/anymore not was ripe
"... it was not yet ripe/... it was not ripe anymore"

b. *Kogda ja vstretil Ivana, on ješče/uze byl ne bolnym/pjanym/serditym*
When I met Ivan, he yet/anymore not was sick/drunk/angry

c. *Kogda ja vstretil Ivana, on *ješče/uze ne byl molod/naiven/nevinen*
When I met Ivan, he yet/ anymore not was young/naive/innocent

d. *Kogda ja vstretil Ivana, on ješče/*uze ne byl starym/xoroso obrazovanym*
When I met Ivan, he yet/ anymore not was old/well-educated

e. *Kogda ja vstretil Ivana, on*ješče/*uze ne byl umnym/glupym*
When I met Ivan, he yet/ anymore not was intelligent/stupid

As (15b) shows, typical temporary predicates like *sick*, *drunk* and *angry* meet both criteria. I will call these predicates bounded, i.e., they have an upper and a lower bound. Predicates like *ripe* and *young* only meet one of the tests. (15) also shows that typical cases of individual level predicates like *intelligent* and *stupid* meet none of the two tests. I will call the latter two types of predicates non-bounded.

According to the criterion in (14) *raw* and *cooked* are non-bounded, as is illustrated in (16ab). Thus, it is predicted that these predicates cannot appear in the agreeing form. This prediction is borne out. In (16c) only the Instrumental is possible.

(16) a. *Kogda on kupil mjaso, ono *ješče/uze bylo ne syroje*
When he bought the meat, it yet/anymore not was raw

b. *Kogda on kupil mjaso, ono ješče/*uze bylo ne varjonoje*
When he bought the meat, it yet/anymore not was cooked

c. *On sjel mjaso syrym a frukty varjonymi*
He ate the meat raw but the fruits cooked

The semantic type of the adjective also restricts the availability of the Instrumental form. If an adjective is non-bounded (intelligent, stupid, well-educated, literate, innocent, naive), only those that denote a property that can be either acquired (well-educated, literate) or lost (innocent, naive) that is, those that meet one or the other of the above tests, can appear in the Instrumental form, as is illustrated in (17).

(17) a. *On vysel iz universiteta xoroso obrasovannym/* umnym*
He came out-of the University well-educated/ intelligent

b. *On ženilsja na ne absolutno naivnym/* glupym*
He married her completely naive/ stupid

I will call the predicates that admit the Instrumental partially non-bounded and those that don't unbounded predicates. We thus arrive at the following correlation between the semantic type of a predicate and the Case forms it admits in Russian (where NOM is short for agreeing Case):

| (18) | bounded | partially non-bounded | unbounded |
|---|---|---|---|
| | NOM/INS | *NOM/INS | *NOM/ *INS |

I will conclude this section with an example that illustrates the correlation between semantic type and syntactic Case form by the way of a minimal pair. In (19a), the adjective 'big' in its agreeing form means 'big compared to other individuals of the class of elephants'. The adjective in the Instrumental means 'grown to full size', i.e., big compared to other stages of an elephant. If the adjective is used as a secondary predicate only the Instrumental is possible (19b). This is entirely expected since it is the Instrumental in (19a) that expresses a property that can be acquired, whereas the agreeing form is used to specify the unbounded reading in (19a).

(19) a. *Etot slon byl bolsoj/bolsim*
This elephant was big-NOM/INS

b. *Ivan vstretil etogo slona *bolsogo/bolsim*
Ivan encountered this elephant big-AKK/INS

## 4 The Choice of the Case form with Bounded Predicates

When the secondary adjectival predicate is a bounded predicate, the choice of the correct Case form in a given context seems to depend on a number of factors. I have to make clear at the outset that in this area I found a lot of speaker variation. The distinctions seem to be rather subtle and in many cases are just a matter of preferences rather than a matter of grammaticality.

In the following, I will thus report only the factors which proved to be the most robust, that is, I will discuss the factors that were considered relevant by the majority of the native speakers asked and will then compare my findings with those reported in the literature, especially with Nichols (1981) and Timberlake (1986). In general, the agreeing Case represents the unmarked form with the Instrumental showing up when additional conditions obtain.

If the adjective is a bounded predicate like *naked*, the choice between the agreeing and the Instrumental form depends on the temporal reference of the sentence, as is illustrated in (20). If the sentence has a specific time reference, the agreeing form is obligatory (20a). If the sentence has a generic or habitual reading, the Instrumental is preferred (20b). I will call this interpretation the temporally restricted reading to distinguish it from the pure depictive reading in (20a).

(20) a. *Ivan rabotajet golyj*
John works naked-NOM
"John works and is naked now"

b. *Ivan rabotajet golym*
John works naked-INS
"John usually works/has the habit of working naked"

For some speakers the adjective in (20b) has a kind of manner interpretation. Whereas the process of John's working and the state of his being naked seem to coincide accidentally in (20a), John's nakedness appears to be volitional and controlled by the subject. In other words, (20b) may also express that being naked is the way or manner in which John (usually) works. We may assume that the manner reading is a derivative of the habitual reading – an inference which some speakers seem to make but is seemingly not necessary for all speakers.

The manner interpretation of (20b) goes very well with the following observation. Adjectives describing psychological states (*sad, angry, happy*) cannot appear in the Instrumental. First, note that psychological adjectives cannot describe the manner in which an event is performed: to purposefully perform some act in a certain manner requires control over that manner. Psychological adjectives express inner states that are not controllable and unvolitional. Hence, they can only be interpreted as true depictives. This is illustrated in (21a). There is one systematic exception to the generalization that psychological adjectives cannot appear in the Instrumental. As shown in (21b), sentences that explicitly contrast the states expressed by adjectival predicates permit the Instrumental.

(21) a. *Ivan rabotajet grustny/*grustnym*
John works sad-NOM/sad-INS

b. *Segodnja on usel veselym, a prisel grustnym*
Today he left cheerful-INS and returned sad-INS

The interpretational differences in (20) and the difference in grammaticality in (21a) seem to suggest that the adjective in the Instrumental is interpreted in a lower position, that is, within the scope of the abstract causative verb *v* (cf. Hale & Keyser 1993, Chomsky 1995) than the adjective in the agreeing form. This reasoning is supported by the fact that, if the two forms are combined in one clause, which yields a marked sentence, only the order in which the agreeing form occupies the higher position is grammatical, as is shown in (22).

(22) a. *Ivan rabotajet golym serdityj*
John works naked-INS angry-NOM

b.* *Ivan rabotajet serdityj golym*
John works angry-NOM naked-INS

Let us now have a brief look at the literature on the subject and see how our findings square with the observations found there. The two most comprehensive investigations of the issue at hand are Nichols (1981) and Timberlake (1986). Nichols describes a dozen or so factors comprising stylistic, morphological, syntactic, semantic as well as pragmatic ones, that influence the choice of case. This study, thus, reflects rather directly my own observation that speakers seem to have difficulties to agree on a relatively small set of factors.

Timberlake's (1986) study is of more explanatory value. In a statistical survey of texts that he augmented with the judgments of 8 native speakers, he extracts two factors as decisive. He also notes that the agreeing Case is the unmarked form with the Instrumental appearing when additional conditions are observed. He distinguishes between the temporal and the modal use of the Instrumental. According to Timberlake, "the temporal instrumental signals that the event denoted by the adjective occurs in temporal sequence in relation to other events in the text"(p.142).

The temporal use of the Instrumental is illustrated in (23) and (24). In (23), the adjective sets the stage for the subsequent events expressed in the remainder in the clause, whereas in (24), the event expressed by the adjective is temporally located with respect to the other events in the narrative.

(23) *Here's what happened once: I came home from the Academy hungry-NOM, stoked up the cookstove, and started to cook some kasha from the remains of the groats*

(24) *Stepan, having lolled around the hospital for a month, returned home healthy-INS*

The modal use of the Instrumental is illustrated in (25). According to Timberlake, "the modal instrumental signals that the state not only holds at the narrated occasion, but holds contrary to expectations derived from general principles" (p. 146). What these general principles are in the concrete case is left undefined by Timberlake. In (25), it is the general expectation that the grass wilts in the fall before it is covered with snow in early winter.

(25) *The following spring the grass grew thick and lush, and went under the snow green-INS*

In Nichol's study change of state is an important factor for choosing the Instrumental over the agreeing form. Also Kennedy & Filip (2000) argue that the Instrumental conveys an added meaning of 'change of stage'. However, some of Timberlake's examples clearly show that 'change of state' cannot be a decisive factor. In (25), the grass went unchanged, namely still green, under the snow. And in (26), the subjects talked about remain unnoticed and the jug remains empty. Nevertheless, the Instrumental is obligatory in these sentences, as is confirmed by the unequivocal native speaker judgments in (26a): of eight speakers consulted, all eight said that they would use the Instrumental in the given sentence.

(26) a. They passed through the front lines of the enemy unnoticed-INS
(8 INS, 0 NOM)

b. Twice on that day he descended to the bottom of the jug and twice he came up empty-INS

In our account, it is quite clear why the Instrumental is obligatory in (26a). The adjective *unnoticed* is not a bounded predicate. It only has an upper boundary. The same holds for (27). The person in question was already well-educated before he came to us. Again, there is no change of state implied in (27). Nevertheless, the adjective has to appear in the Instrumental Case, since the adjective does not denote a bounded predicate.

(27) *On prisel k nam xoroso obrazovannym*
He came to us well-educated-INS

What is really necessary for an adjective to enter into a secondary predication relation is the fact that the adjective denotes a state that has the potential for change. In my account, a predicate has a potential for change if it has at least an upper or a lower bound.

To summarize, what Timberlake calls the temporal use of the Instrumental looks very much like what I called the temporally restricted interpretation of the Instrumental. And what Timberlake calls the modal use of the Instrumental might simply be a subcase of the contrastive interpretation of the Instrumental that I pointed out in connection with psychological predicates.

Thus, we may conclude that with bounded adjectival predicates the Nominative is used as a default and that the Instrumental is preferably used when either the state expressed by the adjective is contrasted with another state (modal use) or when this state is temporally restricted by or temporally ordered with respect to other events in the clause or the context (the temporal use).

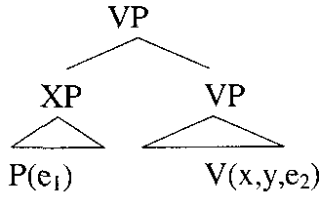
# 5 The Syntax and Semantics of Depictives

Contemplating the semantic contribution of depictive predicates, it seems that a depictive predicate describes its subject at the time it is engaged in another event. In other words, we may say that the main verb and the depictive adjective are predicated of the same stage of an individual. Though these two characterizations of the role of depictives sound almost synonymous, I will show below that they are not and that only the second characterization is correct.

In clauses with depictives, we are dealing with two independent events which are solely related by sharing a participant. That is to say that with depictives, contrary to temporal adjunct clauses, neither event directly specifies (the temporal location of) the other. In the following, I want to address two questions. A) How are depictives to be distinguished from verbal adjuncts, that is, other event-predicates, in a Davidsonian framework? B) Where and how do depictives attach to the clause?

Let us first discuss the question of how depictives can be distinguished from verbal adjuncts. A typical case of verbal modification is given in (28). In this situation, some adjunct XP, for instance, a manner adverb, adjoins to the VP. The semantic interpretation of this syntactic operation is that the two event arguments are identified.

(28)

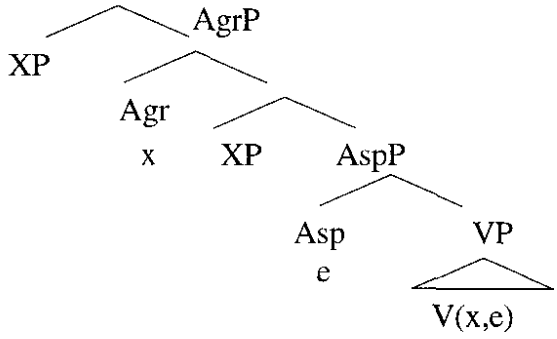



modification: $e_1=e_2$

This is of course not what we want in the case of a depictive secondary predicate as in 'John works naked (now)'. I assume that *naked* is a two place predicate comprising an event argument and an individual argument (naked (x,e)). As I stated above clauses with depictives really involve two events. If anything is to be identified it is the external argument of the verb and the individual argument of the depictive predicate in the example above. There are basically two ways of achieving this.

The first option is to treat functional heads as argument selectors as is illustrated in (29). Aspectual heads would then select the event argument of the verb for further modification whereas Agreement heads would select the respective individual argument for additional specification. To yield the correct interpretation of depictives, only one additional condition has to be ensured, namely that the depictive event $e_2$ properly contains the matrix event $e_1$ . In depictive relations the event expressed by the depictive adjective and the event expressed by the main verb overlap, but there is no implication that the depictive event incepted with the matrix event nor that it ends when the matric event ceases. Thus, the correct characterization between matrix event and depictive event seems to be that $e_1$ $\delta$ $e_2$.

(29)




This account has several advantages. First, it would provide us with a unified theory of the syntax and semantics of adjuncts. Secondly, it would give semantic justification to Agreement Phrases (cf. Chomsky 1995, who dismisses AgrPs for lack of semantic impact). Thirdly, if one desires so, one could get rid of PRO which is needed to achieve what otherwise is done with argument identification.

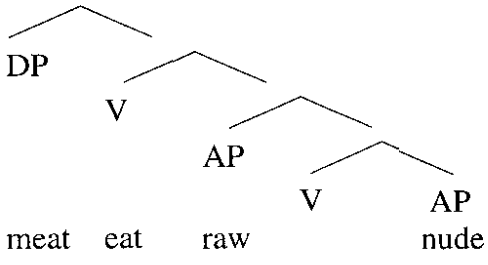
However, there are also problems with this approach. First, English data (VP-preposing, though-movement, Wh-clefting) indicate that both subject and object oriented depictives are part of the VP (cf. Andrews 1982), as is illustrated in (30). Secondly, I will argue below that adjectives in the Instrumental are licensed in the VP.

(30) a. Noa said that she would eat dinner nude, and eat dinner nude she did
a.' Noa said that she would eat the meat raw, and eat the meat raw she did
b. Eat dinner nude/the meat raw though Noa did, nobody thought she was crazy
c. What Noa did was eat dinner nude/the meat raw

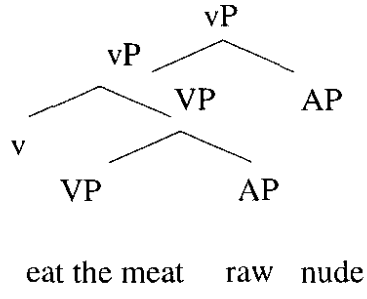
The second option assumes that depictives are base-generated in the VP and may adjoin to Agr-projections in the course of the derivation In this approach, we assume that the effect of argument identification is achieved via a control relation of PRO within the depictive predicate.

I do not take any stand here on whether the Larsonian approach as illustrated in (31a) or the standard approach in terms of right-adjunction as illustrated in (31b) should be taken. I only want to mention that in the Larsonian approach it is more difficult to identify the controller of PRO structurally, whereas in the standard approach the controller can be simply identified as the closest m-commanding DP.

(31) a.




b.




I assume that depictives in the Instrumental are base-generated and licensed in the VP and can thus remain there. Following Bailyn and Citko (1999), I assume that the Instrumental is an inherent Case that is assigned by $Pred^0$ just in case $Pred^0$ is not itself assigned Case (cf. (32)). This Case is then checked by movement of AgrP into [Spec,PredP]. The event

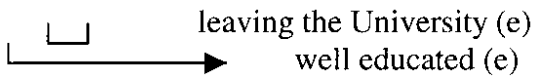
argument of the depictive in the Instrumental is then bound by a temporal operator the restriction of which is formed by the rest of the clause, as is illustrated in (34) below.

(32) $[_{PredP}\ Pr^{0}\ [_{AgrP}\ PRO\ [Agr\ AP]]]$

Furthermore, I assume that depictives in the agreeing case are base-generated in the VP as well, but are licensed by adjoining to the respective AgrP where they receive the true depictive interpretation (neither event locates the other).

Let us again look at the semantics of depiction with respect to predicates which only have a lower boundary like *ripe*, *well-educated* and *literate*. We saw that these predicates cannot be interpreted as true depictives. They cannot appear in the agreeing form and are realized in the Instrumental, receiving the restrictive temporal interpretation. Given the semantics of depictives in which the depictive event properly contains the matrix event and given the fact that predicates with a lower boundary once they are acquired become permanent properties, it follows why these predicates pattern with unbounded predicates like *intelligent* in not admitting a true depictive interpretation: at the interval during which the matrix event holds predicates with only a lower boundary have already become timeless properties, as is illustrated in (33).

(33) a. He left the University well.educated-INS

b. 

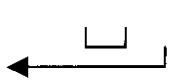

The question then arises why predicates with only a lower boundary can be rescued by being put in the Instrumental Case while unbounded predicates like ‚intelligent' cannot, as is illustrated in (34a). As the contrast in (34bc) shows, this distinction can be reduced to a distinction that holds between the respective interpretations of (34a). I assume that (34c) is out for pragmatic reasons. It is simply infelicitous to temporally restrict an atemporal property like *intelligent*.

(34) a. *On vysel iz universiteta xoroso obrasovannym/*umnym*
He came out-of the University well-educated/intelligent

b. When he left the university, he was well-educated
c.?? When he left the university, he was intelligent

Let us now look at the semantics of depiction with respect to predicates which only have an upper boundary like *young*, *naive* and *raw*, as is illustrated in (35). With the given semantics, namely that the depictive event properly contains the matrix event, we cannot explain why these predicates cannot be true depictives. At the interval during which the matrix event holds predicates with an upper boundary do not denote a timeless property and are in this respect clearly distinct from unbounded predicates. Note also that so far we have no explanation for why true depictives must be stage level predicates, that is, must be bounded predicates.

(35) a. *On zenilsja na nej molodym*
He married her young-INS

b. 


Below I will argue that this restriction follows from two assumptions. A) In adjectival predication, subject and predicate agree in boundedness. B) While temporal clauses relate intervals, depictives relate stages.

I think that Carlson (1977) was right in proposing the existence and relevance of stages, but not with respect to the assumption that stages are arguments of specific predicates. I like to propose to treat stages as interpretations of DPs, where a stage is defined as a pair of indices, an individual one and a temporal one such that (i, t):= the stage of individual i at time t. Furthermore, I will assume that a bounded individual is interpreted as a stage of that individual.

To illustrate that not only events but also individuals have a temporal dimension, let us look at an utterance like (36) in the context that Peter is dead now. Kripke, establishing the causal theory of names, convincingly argues that a name keeps on referring to the causally related bearer however that person or the world around him may change. In this theory, we may wonder what the name Peter refers to, now that Peter is dead. Depending on one's philosophical preferences it could be Peter's eternal soul or a bundle of bones in Peter's grave. In any event, and this is only half jokingly put, we do not want (36) uttered now to mean that Peter's eternal soul or his bones visited Mary a year ago. In an intensional semantic framework (36) would not render any difficulties. One would evaluate the expression *Peter* with respect to a past time and it would denote the set of properties that Peter had at this time and (36) would then state that among those be the property of visiting Mary. However, within a purely extensional framework like Davidson's this option is not available and it seems to me that to solve this problem one needs to be able to talk about temporal slices of an individual, that is, in the case at hand, of a past stage of Peters'.

(36) Peter visited Mary last year.

That stages are not necessarily arguments of particular predicates may be illustrated in the following way. One may wonder whether a predicate like *green* is a stage-level or an individual level predicate. It seems that the answer to this question depends on the choice of the subject (37a). And (37b) is a case where both readings are available with the same subject. (37) can mean that the light has a green phase just now or that the light as physical object is (painted) green. In my view, the readings depend on what the DP *die Ampel* is meant to refer to, to an individual or to a stage of that individual.

(37) a. Die Erbsen sind grün. Die Bananen sind (noch) grün
*Peas are green. Bananas are (still) green*

b. Die Ampel ist grün.
*The traffic-light is green*

Given the assumptions made so far, how can we derive the restriction on stage-level predicates with depictives? I don't know whether there is a genuine semantic account of this restriction but a syntactic account could look like this. If depictive predicates do not contain a tense-head, as I have assumed in (32), then the proposition expressed by the depictive can

only be temporally anchored, if the subject of the depictive is assigned (via control by its antecedent) an interpretation of a stage. In other words, the subject is assigned, instead of a single index of an individual, a pair of indices, an individual one and a temporal one. This is different from the control relation in infinitival clauses. As (38a) shows, in infinitival clauses two assertions can be made about two different stages of the same individual. This is possible since infinitival clauses contain an extra Tense-head which is subject to independent temporal control by the matrix verb. This is also different from temporal adjuncts which specify or restrict the temporal index of the matrix predicate. As (38b) illustrates, these expressions relate intervals.

(38) a. Peter promised [ PRO to visit Mary tomorrow]
b. Yesterday/when Mary came in, Peter slept

Coming back to depictive secondary predicates, since subject and predicate agree in boundedness as I have assumed above, it follows that only bounded predicates may appear in true depictives. With predicates in the Instrumental, the event argument is bound by a temporal operator. Thus they are not subject to temporal anchoring via Tense and only have to obey the weaker pragmatic condition of denoting temporally restrictable properties.

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# Pragmatic Constraints on (Adverbial) (Temporal) Quantification[1]

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## Abstract

Even if we can generate a logical form, principles of use may limit the ways in which we can use it. In this paper, I motivate one such principle of use, and explore its effects. Much of the discussion involves kinds of sentences that have received attention in the literature on "individual-level predicates."

## 1 A possible line of argumentation, and reasons to reject it

Here is a familiar line of argumentation similar to one advanced by Kratzer 1995. The argument starts from the idea that in the logical form of a sentence containing an adverbial quantifier like *always*, the quantifier bears an index. The logical form for a sentence like (1a) on this approach is something like (1b). (And on this approach logical forms that conform to the schema $[_{\alpha}\ [...always_I...]\ \beta\ ]$ are interpreted roughly as in (1c).) The argument calls attention to the fact that, unlike sentences like those in (1a), sentences like those in (2) sound bizarre. It points out that we can explain why they sound bizarre if we assume, along with some other assumptions, that their possible logical forms contain no item that can be coindexed with the quantifier. It concludes on this basis that indeed (2) contains no item that can be coindexed with the quantifier.

(1) a. Ingrid is always on the phone.
b. lf: $[_{\alpha}$ [...always$_1$...] $[_{\beta}$ ... **1** ... Ingrid on the phone ... ]
c. $[[\ \alpha\ ]]^{g}$ (w) = 1 as long as for all time intervals t that satisfy in w the contextually salient property of time intervals, $[[\ \beta\ ]]^{g\ 1->t}$ (w) = 1.

(2) Ingrid was always Swedish.

My hope in this paper is to defeat this line of argumentation. My thesis is that there are principles of grammar that (2) violates even if we analyze it as containing an item that can be coindexed with the quantifier. If this is correct, then just on the basis of the strangeness of (2), we have no evidence for the claim that its logical form lacks these additional indices (or for that matter for the assumptions that derive the bizarreness of (2) given the lack of additional indices). Maybe there is evidence for something like this, but it doesn't come from sentences like (2).

My main goal in this paper is to independently motivate a principle from which it happens to follow that (2) sounds bizarre. I will demonstrate some of the consequences of this principle, and I will conclude by suggesting that once we recognize this principle, we gain some insight into the question of what interpretations sound natural for sentences with indefinites. As far as this workshop is concerned, this paper should serve as a cautionary note.

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[1]This is the first draft ever of the material under discussion, and likely contains many errors. Comments and corrections are more than welcome. Thanks to the ZAS Workshop on Predicative Constructions for the opportunity to present the work here, and to Andrea Bonomi, Gennaro Chierchia and Manfred Krifka for related chats.

To the extent that the pragmatic principle here can answer the question of why sentences like (2) sound bizarre and what interpretations sound natural for sentences with indefinites, we should not use the same facts to motivate syntactic stipulations that do the same work.

To see why I think that (2) incurs problems that should not be traced to the presence or absence of an item coindexed with the quantifier, consider the sentence in (3).

(3) The student who finished first was always Swedish.

Imagine that we were both present at a series of exams, which took place from Monday through Saturday. We both saw that each time a different person finished first. In fact, the pattern was as in (4a):

(4) We both see:

a.

| date: | M | T | W | Th | F | S |
|---|---|---|---|---|---|---|
| fastest student: | Max | Ingrid | Olof | Ingmar | Ingvar | Ingeborg |

You just saw the students, you don't know who they were or what their nationalities were, and so I tell you (3) to inform you of their nationalities. There is nothing bizarre about (3) when used in this context. What can we conclude from this? If the absence of an item coindexed with the quantifier would render the sentence *bad*, and in fact the sentence is *good*, we can conclude that the sentence admits a logical form containing an item coindexed with the quantifier.

Now that we have established that (3) admits a logical form containing an item coindexed with the quantifier, imagine a different situation. Just as before, we were both present at the exams, but this time the pattern is different:

b.

| date: | M | T | W | Th | F | S |
|---|---|---|---|---|---|---|
| fastest student: | Ingrid | Ingrid | Ingrid | Ingrid | Ingrid | Ingrid |

Since we were both there, we both saw that the same person finished first each time. Still, you don't know who it was or what her nationality was. In this context, I cannot use (3) to inform you of the student's nationality. It sounds bizarre. And, since we have already concluded that the sentence admits a logical form containing an item coindexed with the quantifier, it can't be that its bizarreness is due to the lack of such a logical form.

I think that it is reasonable to expect that the same thing that renders (3) bizarre in this context renders (2) bizarre. That is why I think that (2) incurs problems that have nothing to do with the lack of an item that can be coindexed with the quantifier.

A similar point can be made by considering sentences like (5). Unlike the sentence in (6), which sounds fine and therefore must contain an item coindexed with the quantifier, (5) sounds bizarre, at least on an initial reading and encountered in isolation.

(5) John always knows whether Ingrid is Swedish.

(6) John always knows whether Ingrid is on the phone.

Now, when it comes to the sentence in (6), it can be argued not only that the quantifier is coindexed with another item, but more specifically that it is coindexed with an item in the

matrix clause. (I will sketch how in a moment.) On the assumption that the only syntactic difference between (5) and (6) is the embedded clause, this means that (5) too must contain an item in the matrix clause that *always* can be coindexed with. So it can't be that the bizarreness of (5) is due to the lack of this kind of item.

I think that it is reasonable to expect that the same thing that renders (5) bizarre renders (2) bizarre, and so that is another reason for thinking that (2) incurs problems that have nothing to do with the lack of an item that can be coindexed with the quantifier.[2]

The argument that sentences like (6) contain an indexed item in the matrix is complicated but its rough outline is as follows. It assumes that the possible logical forms for (6) are as in (7b)

(7) a. John always knows whether Ingrid is on the phone.
b. [...always$_i$...] [$_\beta$ ... John know whether... [$_\gamma$ ] ]

where the embedded constituent $\gamma$ is the same kind of constituent that you get in the logical form of simpler sentences like *Ingrid is always on the phone*, a constituent that contains an index:

(8) a. Ingrid is always on the phone.
b. [...always$_i$...] [$_\gamma$ ...i ...Ingrid on the phone ]

On the basis of this, it argues that to make the right predictions about the semantics of sentences like (7a) and (8a), the constituents $\beta$ and $\gamma$ must be interpreted as follows:

(9) $[[\ \beta\ ]]^g$ = $\lambda$w. if, in w, Ingrid is on the phone for the duration of g(i)
then, in w, John for the duration of g(i) believes Ingrid
to be on the phone; and
if, in w, Ingrid is *not* on the phone for the duration of g(i)
then, in w, John for the duration of g(i) believes Ingrid
*not* to be on the phone

(abbreviated further: $\lambda$w. in w, for the duration of g(i) John knows whether Ingrid is on the phone)

(10) $[[\ \gamma\ ]]^g$ = $\lambda$w. in w, Ingrid is on the phone for the duration of g(i)

It is important to note here that, in the semantics of $\beta$, g(i) plays a role in determining the duration of John's beliefs.

The argument then points out that, on certain ideas about semantic composition, to say that the matrix clause in (7b) does *not* contain an indexed item amounts to saying that the matrix clause material behaves semantically like a function that, given the denotation that you get for $\gamma$, will yield the denotation that you get for $\beta$. That is, it will behave like a function that, for any arbitrary assignment g and index i such that g(i) yields a time interval, will take a proposition of the kind in (10) and give you a proposition of the kind in (9).

[2] See de Swart 1991 for arguments of a similar nature.

(11) The matrix clause material "behaves like" some function F with the characteristic that,

for any time interval y,
F( λw. in w, Ingrid is on the phone for the duration of y )
= λw. in w, for the duration of y John knows whether Ingrid is on the phone.

But at this point problems arise. On the one hand, one can make a case that it is implausible to assume that the matrix clause behaves like this. On the other hand, assuming that the matrix clause behaves like this seems to make wrong predictions. Therefore, we do not want to say that the matrix clause in (7b) lacks an indexed item.

The wrong predictions that the proposal in (11) makes are as follows. Parallel to the pair of sentences in (7) and (8), we have pairs of sentences like those in (12a) and (13a), for which we would posit parallel logical forms:

(12) a. John always knows whether at 5pm on the following day Ingrid is on the phone.
b. [...always$_j$...] [$_\beta$ ... John know whether... [$_\delta$ ] ]

(13) a. At 5pm on the following day Ingrid is always on the phone.
b. [...always$_j$...] [$_\delta$ ...j ...at 5pm on the following day Ingrid on the phone ]

Given the way (13a) is interpreted, the right semantics for δ seems to be:

(14) $[[ \delta ]]^g$ = λw. in w, Ingrid is on the phone at 5pm on the day after g(j)

Now by assumption to obtain $[[ \beta ]]^g$ we apply the function F to $[[ \delta ]]^g$ . So take an arbitrary assignment g and index j. What will F yield for the proposition in (14)? F will yield:

(15) $[[ \beta ]]^g = F([[ \delta ]]^g) =$
λw. in w, at 5pm on the day following g(j), John knows whether Ingrid is on the phone

Glossing over some steps, the consequence will be that a sentence like (12a) should express that all relevant times are such that John knows one day later at 5pm whether Ingrid is on the phone. But it doesn't express that. It expresses that all relevant times are such that John knows *then* whether *one day later at 5pm* Ingrid is on the phone.

## 2 What is the generalization about when (3) (=(16)) can be used?

I will now return to the sentence in (16), and attempt to describe the conditions under which it is infelicitous. On the basis of this description, I will then propose a principle of pragmatics that determines when it is appropriate to use sentences of this kind.

(16) The student who finished first was always Swedish.

The discussion in this section will rely on some assumptions that I will make about the logical forms available for sentences like (16) and about aspects of the way these logical forms are interpreted. These assumptions are intentionally simplified, and in the rest of the paper I will take the simplifications for granted. I will hope that on different assumptions, the essence of

what I have to say will remain even though the details will have to be different. The assumptions are these:

First, as far as the syntax of sentences like (16), I will be consistent with what I have been assuming until now. I will assume that in the lfs of these sentences all items have reconstructed to below the VP level, and I will be assuming that there is nothing interpretable above *always*, which is adjoined to VP, so that everything above *always* can be ignored. (This is a big simplification for one thing because it means that I am ignoring tense nodes, and thus tense information.) As before, I will assume that adverbial quantifiers like *always* are indexed. The interpretable pieces of (16)'s lf are thus as in (17).

(17) $always_1\ [_\alpha\ ]$

When it comes to my assumptions about how lfs like (17) are interpreted, I will be departing slightly from an idea that I alluded to earlier (in (1c)). Earlier, I assumed that the context makes salient a property of time intervals, and that we use this property to determine the intervals that *always* quantifies over (informally speaking). Now, I will assume that the context makes salient a *set* of time intervals, and that we interpret quantifiers like *always* as quantifying over the members of this set. Specifically, an lf like (17) will be interpreted as in (18). This simplification will strongly affect the terms of the coming discussion.

(18) $[[\ always_i\ [_\alpha\ ]\ ]]^g =$
$\lambda w$. for all time intervals t in the contextually salient set S of time intervals,
$[[\ \alpha\ ]]^{g\,i\,->\,t}(w) = 1$.

In general, interpretation will work in such a way that, when we compute the denotation of a sentence's lf with respect to an assignment, we will get a function from worlds to truth values. The way in which these denotations fit into a theory of the way truth judgments depend on syntactic structures is the usual one: on this theory, when we say that a sentence is true, we are saying that we can find an lf for it and an assignment such that the actual world is characterized by the function we get by evaluating the lf with respect to the assignment.

Once we make assumptions like these, we can draw conclusions about other aspects of the semantics of (16). Consider once again sentence (16) as uttered in the first scenario, on which the student who finishes first is different each time.

(19)

| Exam date: | M | T | W | Th | F | S |
|---|---|---|---|---|---|---|
| Fastest student: | a | b | c | d | e | f |

The fact is that, if we know that the students who finished were all Swedish-born, we would say that the sentence is true. If we assume that the lf of (16) conforms to the format in (17), then we might draw the following conclusions from this. First, the context makes salient a series of exam days ((20a)) – specific time intervals during which the actual exams occurred. Second, in the lf of (16), the denotation of the constituent that combines with *always* is as in (20b).

(20) a. S = { Monday, Tuesday, Wednesday, Thursday, Friday, Saturday }

b. $[[ \alpha ]]^g$ = λw. the individual who in w is the student first to finish the exam held in g(1) is Swedish-born in w.

With this, we account for the fact that, if we think that the students who finished first were all Swedish, then we take the sentence to be true. (Reasoning: Take any assignment. Given (18) and (20), the function that we get by evaluating the lf of (16) with respect to that assignment will be as in (21) below. This function characterizes the actual world as long as on each exam day the first student to finish was Swedish. Now, by hypothesis, to say that (16) is true is to say that the actual world is characterized by a function that we get when we evaluate (16)'s lf with respect to some assignment. So suppose that we think that the actual world is such that on each exam day the first student to finish was Swedish. Well, this amounts to saying that we think that the actual world is characterized by the function in (21). So given that the function in (21) is a function that we get by evaluating (16)'s lf with respect to some assignment, we should take (16) to be true.)

(21) λw. For all days t in S, the individual who in w is the student first to finish the exam held in t is Swedish-born in w.
(= $[[ (17) ]]^g$ for all g)

In what follows, I will assume that these are the right conclusions to draw. If these are the right conclusions to draw, then to say that (16) is true is to say that the function in (21) characterizes the actual world. Equivalently, to say that (16) is true is to say that all of the functions in Σ characterize the actual world:

(22) Σ = { λw. the individual who in w is the student first to finish the exam held on MONDAY is Swedish-born in w.,
λw. the individual who in w is the student first to finish the exam held on TUESDAY is Swedish-born in w.,
λw. the individual who in w is the student first to finish the exam held on WEDNESDAY is Swedish-born in w.,
λw. the individual who in w is the student first to finish the exam held on THURSDAY is Swedish-born in w.,
λw. the individual who in w is the student first to finish the exam held on FRIDAY is Swedish-born in w.,
λw. the individual who in w is the student first to finish the exam held on SATURDAY is Swedish-born in w. }

Now, here is the generalization that I am proposing specifically about when (16) can be used. This generalization makes reference to the function in (21). On the assumptions so far, (21) is the denotation of (16)'s lf with respect to any assignment, so on the assumptions so far the generalization makes reference to the denotation of (16)'s lf.

(23) <u>Proposed generalization about (16):</u>
The cases where (16) sounds strange are the cases where we could determine whether (21) holds of the actual world by determining whether the propositions in some proper subset of Σ hold of the actual world. (And moreover – as will be discussed below -- the smaller the subset, the worse (16) sounds.)

Consider for example our second scenario, repeated in (24).

(24)

| Exam date: | M | T | W | Th | F | S |
|---|---|---|---|---|---|---|
| Fastest student: | a | a | a | a | a | a |

We were both present at all the exams, and I tell you (16) afterwards to inform you of a's nationality.

At the point when I utter this sentence, we are both aware that the student who finished first is the same for all t in S. That is,

(25) We are both aware that the actual world w0 has the following property:

For all t1, t2 in S, the individual who in w0 is the student first to finish the exam in t1 is the individual who in w0 is the student first to finish the exam in t2.

This means that, to determine whether (21) holds of the actual world, it is enough to determine whether just one of the propositions in Σ, say (26), holds of the actual world.

(26) λw. the individual who in w is the student first to finish the exam held on TUESDAY is Swedish-born in w.

(Suppose it does. Then

(27) the individual who in w0 is the student first to finish the exam held on Tuesday is Swedish-born in w0.

And then from (25) – omitting some steps -- it will follow that

(28) For all days t in S, the individual who in w0 is the student first to finish the exam held in t is Swedish-born in w0.

i.e. that (21) holds of the actual world. On the other hand, suppose it doesn't. Then

(27') the individual who in w0 is the student first to finish the exam held on Tuesday is NOT Swedish-born in w0.

And then from (25) it will follow that

(28') For all days t in S, the individual who in w0 is the student first to finish the exam held in t is NOT Swedish-born in w0.

i.e. that (21) does not hold of the actual world.)

Here, then, we can determine whether (21) holds of the actual world by considering just a singleton subset of Σ. And the intuition is that (16) is very strange.

I think that, when we consider variations on the scenario that we have been considering, we find that the strangeness of (16) is (inversely) related to the size of the smallest subset of Σ that can serve to verify (21). Imagine, for example, the variation in (29i), on which we see one student finishing first every day from Monday through Wednesday, and a different student finishing first every day from Thursday through Saturday. The intuition, I think, is that in this slightly altered scenario it is still quite strange to utter (16), but perhaps not quite as strange as in the scenario on which the same student finishes first each time. In this new case, we can't determine whether (21) holds of the actual world by considering a singleton subset of Σ, but we can by considering a two-membered subset – for example, {λw. the individual who in w is the student first to finish the exam held on TUESDAY is Swedish-born in w, λw. the individual who in w is the student first to finish the exam held on FRIDAY

is Swedish-born in w}. When we alter the scenario still further, so that three students are involved ((29 iv)), (16) gets better still. And so on.

(29) Other scenarios

| | M | T | W | Th | F | S | # propositions in Σ that we need to verify to know whether (21) is true | Judgment |
|---|---|---|---|---|---|---|---|---|
| i. | a | a | a | b | b | b | two | ??? |
| ii. | a | a | a | a | a | b | two | ?? |
| iii. | a | a | a | b | a | a | two | ?? |
| iv. | a | a | b | b | c | c | three | ?? |
| v. | a | a | b | c | d | a | four | ? |

## 3 A constraint on the use of sentences with adverbial quantifiers

One way of looking at these facts is as follows. A speaker who utters (16) in the scenarios that differ from our first scenario (on which a different student finished first each time) is quantifying over more things than he needs to in order to make his point. In using the sentence in (16), he is stating that all of the times in one set have a certain character – but he knows that we could have drawn this conclusion if he had informed us that all of the times in a smaller set had that character. Specifically, in using the sentence in (16) he is stating that all members of { Monday, ..., Saturday } are such that the fastest student on that day was Swedish. But he knows that we could have drawn this conclusion if he had informed us that all of the times in a smaller set have this character. On our second scenario, one such smaller set is { Tuesday }.

Conjecture: perhaps there is something wrong with quantifying over more things than you need to in order to make your point.

I think that judgments of the sentence in (30) reinforce this impression. The judgments of (30) are parallel to the judgments of (16). In the context of our first scenario, it seems a reasonable sentence for the speaker to utter in order to communicate something (negative) about the nationalities of the fastest students. In the context of our second scenario, it does not. On a plausible analysis of (30), a speaker who used it in this context would be claiming that *none* of the members of { Monday, ..., Saturday } are such that the fastest student on that day was Swedish. In the case of the second scenario, however, the speaker is aware that, to get the addressee to draw this conclusion, he could confine himself to the claim that none of the members of a smaller set – say { Tuesday } – have the relevant property.

(30) The student who finished first was never Swedish.

So I will follow through with the conjecture. I propose, roughly speaking, that a principle of pragmatics tells us not to use a sentence like (16) (or (30)) to quantify over the times in one set when we know that the hearer could draw the conclusion that the sentence is true by considering a parallel quantification over a smaller set. A sentence like (16) (or (30)) will sound funny if we think that the speaker who used it violated that principle.

To be more precise, the principle that I have in mind regulates the sentences that a speaker can make use of by regulating the *lfs* that he can make use of. Given my assumptions so far, it is natural to suppose that a speaker who asserts a sentence has in mind a particular lf for the sentence (call it L) and a particular assignment (call it g), and that his purpose in uttering the sentence is (among other things) to convey that $[[L]]^g$ characterizes the actual

world. Let's assume this.[3] The principle that I have in mind narrows down what a speaker can hope to convey in this way by declaring some lfs, on some occasions, off limits. Some sentences have only one lf, some have more than one. The principle will effectively ban a speaker from asserting a sentence if, for example, the sentence has only one lf, and the principle blocks the use of this lf.

To talk about lfs, I will use the following (informal) terminology:

First of all, consider again the way an lf with *always* gets interpreted.

(31) $[[\ always_i\ [_\alpha\ \ ]\ ]]^g =$
$\lambda w$. for all time intervals t in **the contextually salient set of time intervals**,
$[[\ \alpha\ ]]^{g\,i\,->\,t}(w) = 1$.

Informally speaking, lfs of the form [always$_i$ $\alpha$ ] quantify over members of the contextually salient set of time intervals. We might express this by calling this set the <u>domain of quantification</u> for $[[\ always_i\ \alpha\ ]]^g$.

For every lf of the form [always$_i$ $\alpha$ ] and assignment g, we can imagine an alternative function that differs only with respect to what set is being quantified over.

(32) a. $\lambda w$. for all time intervals t in set $\sigma 1$, $[[\ \alpha\ ]]^{g\,i\,->\,t}(w) = 1$.
b. $\lambda w$. for all time intervals t in set $\sigma 2$, $[[\ \alpha\ ]]^{g\,i\,->\,t}(w) = 1$.
c. $\lambda w$. for all time intervals t in set $\sigma 3$, $[[\ \alpha\ ]]^{g\,i\,->\,t}(w) = 1$.
...

Let us call these functions <u>domain-variants</u> of $[[\ always_i\ \alpha\ ]]^g$. (32a) is a <u>domain-variant</u> of $[[\ always_i\ \alpha\ ]]^g$ <u>with domain</u> $\sigma 1$, (32b) is a <u>domain-variant</u> of $[[\ always_i\ \alpha\ ]]^g$ <u>with domain</u> $\sigma 2$, etc. Similarly, $\sigma 1$ is the domain for the domain-variant of $[[\ always_i\ \alpha\ ]]^g$ given in (32a), etc. In general, lfs of the form [QUANT$_i$ $\alpha$ ] – where QUANT$_i$ stands for an adverbial quantifier -- will behave analogously to lfs of the form [always$_i$ $\alpha$ ]. That is, their denotations will be as in (33). Accordingly, we will be able to talk analogously about domain-variants of $[[QUANT_i\ \alpha]]^g$.

(33) $[[\ QUANT_i\ \alpha\ ]]^g =$
$\lambda w$. for *proportion* $\delta$ of the time intervals t in the contextually salient set of time intervals,
$[[\ \alpha\ ]]^{g\,i\,->\,t}(w) = 1$.

With this in mind, here is a stab at the principle that constrains a speaker's choice of lf. It is a rule for speakers to follow:

[3] In general, when people talk about the *readings* that sentences have, they might be presupposing something like this. One way of construing the claim that a sentence does/does not have a particular reading is as saying that a speaker can/cannot come up with a relevant lf and assignment that together yield a particular kind of function from worlds to truth values. In Section 5, I too will talk about readings, I will assume that this is the right way of construing talk about readings, and moreover I will assume, together with a lot of literature, that people have intuitions about the readings that a sentence can have.

**(P)** Rule:

(For any g),

*Do not use an If of the form* [QUANT$_i$ $\alpha$ ] *to express that* [[QUANT$_i$ $\alpha$]]$^g$ *holds of the actual world*

when you can find a domain-variant of [[QUANT$_i$ $\alpha$]]$^g$ , $\Delta$, with the following characteristics:

i. the domain for the domain-variant $\Delta$ is a proper subset of the domain for [[QUANT$_i$ $\alpha$]]$^g$

ii. it follows from what the parties to conversation are taking for granted about the actual world that [[QUANT$_i$ $\alpha$]]$^g$ holds of the actual world as long as $\Delta$ holds of it.[4]

On its own, of course, this principle does not explain why sentences sound strange. Over and above this, I assume that a hearer can reflect on whether the assertion of a sentence obeys (P) or not, and will find the sentence strange if it does. Specifically, I propose (Q) (both aspects of which hopefully derive from more general aspects of the way we judge sentences).

**(Q)** a. A sentence whose only If is of the form [QUANT$_i$ $\alpha$ ] will sound strange if we think that the use of this If (together with any assignment) violates (P).[5]

b. If we know that the speaker can find a $\Delta$ that has the relevant characteristics and that has only *one* element in its domain, then the sentence will sound terrible. Less terrible if two, etc.

Now here is how principle (P) will apply to the use of (16) on our second scenario. By assumption, (16) has only one kind of If – the one given in (17) – and the denotation of this If with respect to an arbitrary assignment g is repeated in (34a,b). (The denotation will be the same no matter what assignment the speaker chooses. In what follows I will be sloppy and write [[ (17) ]]$^g$ to mean this one object that is the denotation of (17) with respect to any assignment. This might cause some confusion but I trust the reader to correct for it.)

(34) a. [[ (17) ]]$^g$ = $\lambda$w. For all days t in S, the individual who in w is the student first to finish the exam held in t is Swedish-born in w.

b. S = { Monday, Tuesday, Wednesday, Thursday, Friday, Saturday }

One possible domain-variant $\Delta$ of [[ (17) ]]$^g$ is the one given in (35).

(35) One possible domain-variant:

$\Delta$ = $\lambda$w. For all days t in {**Tuesday**}, the individual who in w is the student first to finish the exam held in t is Swedish-born in w.

( = $\lambda$w. The individual who in w is the student first to finish the exam held on Tuesday is Swedish-born in w. )

It so happens that the domain of $\Delta$ is { Tuesday }, which is a proper subset of the domain of

[4] Call *C* the set of worlds compatible with the information that the parties to conversation are taking for granted (cf. Stalnaker 1979). Then another way of putting (ii) is as follows: For every world w in C, [[QUANT$_i$ $\alpha$]]$^g$(w) = 1 iff $\Delta$(w) = 1.

[5] More precisely: if, given what we think about *what the speaker thinks is being taken granted about the actual world*, it follows that the speaker would violate (P) by using the relevant If.

$[[\ (17)\ ]]^g$ . What this means given (P) is that, if it follows from what the parties to conversation are taking for granted about the actual world that $[[\ (17)\ ]]^g$ holds of the actual world as long as $\Delta$ does, then the speaker is banned from using (17).

Now, on our second scenario, this *does* plausibly follow from what the parties to conversation are taking for granted. The important aspect of this scenario was that both parties to conversation were present at all the exams and saw that the same student finished first each time. This makes it likely that the following is being taken for granted:

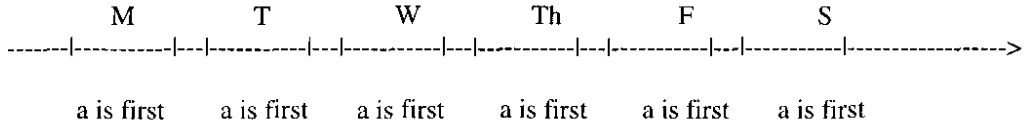
(36) For all t1, t2 in S, the individual who in w0 is the student first to finish the exam in t1 is the individual who in w0 is the student first to finish the exam in t2.

But given (36), if $\Delta(w0) = 1$ we can conclude that $[[\ (17)\ ]]^g(w0) = 1$ and if $\Delta(w0)$ is not 1 we can conclude that $[[\ (17)\ ]]^g(w0)$ is not 1. (We went through the relevant reasoning in the previous section.) In other words, given (36) we can conclude that $[[\ (17)\ ]]^g(w0) = 1$ as long as $\Delta(w0) = 1$. So – assuming (36) is indeed being taken for granted – (P) will prohibit the use of If (17) on the second scenario. Moreover, since by assumption (17) is the only If that the sentence in (16) has, (P) will effectively prohibit the use of the sentence in (16).

What will be the consequence? If we think that (36) is being taken for granted (or more precisely that the speaker thinks that it is), then we will think that the speaker is violating (P) by using (16). Accordingly, the utterance of (16) will sound strange. And given that the relevant domain-variant had only one element in its domain, the utterance of (16) will sound *very* strange.

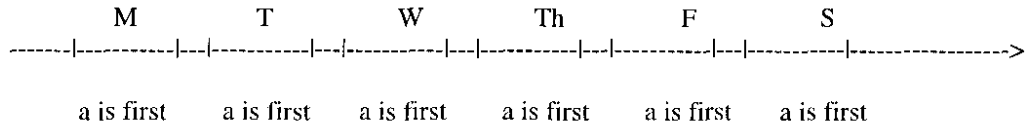
In what follows, in discussing examples like these, I will sometimes take an expository shortcut: I will draw a diagram that represents the knowledge of the world that the parties to conversation are taking for granted. In the case of the scenario we just considered, the diagram would look like this:

(37)



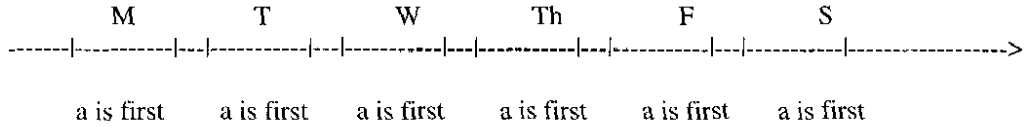

I will only be considering cases of If s whose denotations are the same with respect to all assignments. To show that (P) blocks a particular If, I will show that: (i) if we add to the diagram the information that a certain domain-variant characterizes the actual world, then from the information on the diagram we can conclude that the denotation of the If characterizes the actual world; if we add to the diagram the information that the domain-variant does *not* characterize the actual world, then from the information on the diagram we can conclude that the denotation of the If does *not* characterize the actual world. For example, if we add to the diagram the information that $\Delta$ characterizes the actual world

(38) a.




we have enough information in the diagram to conclude that [[ (17) ]]$^g$ characterizes the actual world. If instead we add to the diagram the information that Δ does *not* characterize the actual world

b.




we have enough information in the diagram to conclude that [[ (17) ]]$^g$ doesn't either.

## 4 Some consequences of this constraint

I will now demonstrate some of the consequences of the pragmatic constraint that I have identified. I am going to go through a number of sentences which have lfs of the form [QUANT$_i$ α ], and see what it predictions it makes about the felicity of these sentences.

If the approach that I have been taking is correct, then there are a number of factors that play a role in determining the infelicity of a sentence with an lf of the form [QUANT$_i$ α]. One is the denotation of α, because that will play a role in determining the denotation of the whole lf and therefore its possible domain variants. Another is the specific set of times that the context makes salient, because that is what functions as the domain of [[QUANT$_i$ α]]$^g$. Another is what we think is being taken for granted about the world, since this will play a role in determining what we can conclude about the truth of the original sentence given the truth of a domain variant. So demonstrating the predictions that (P) makes will potentially require us to take a stand on all of these factors. We will see, however, that in a large number of cases, just taking a position on one or two of these factors will be enough to make a prediction.

One remark in advance. In examining the predictions that we make once we take (P) into account, I am going to assume that apart from (P) there is an additional constraint on the use of quantifiers like *always* and *never*:

(39) Only use [ QUANT$_i$ α ] if (for some g) the domain of quantification for [[ QUANT$_i$ α ]]$^g$ contains more than three objects.

This can be independently motivated, and should follow from more general restrictions on the use of quantifiers (parallel restrictions apply to *every*, etc.). (Cf. de Hoop/de Swart 1989.) Without going through the reasoning, I will just note that some evidence for (39) comes from judgments of our old sentence (16) (= (40a)) on some variants of our first scenario. On a

scenario where there are only two exam days instead of six ((40b)), the sentence sounds very odd. When there are three ((40c)), it still sounds odd (though less odd). When there are four ((40d)), it doesn't sound bad at all.

(40) a. The student who finished first was always Swedish.

b. M T ??? c. M T W ? d. M T W Th not bad
a b a b c a b c d

**4.1**

The first case that I will consider is the case of the sentence we started out with ((41a)). I will assume that the only lfs it has are of the kind we have considered so far, one where *always* combines with another constituent ((41b)).

(41) a. Ingrid was always Swedish.
b. lf: always$_i$ $_\alpha$[ ... ]

What we assume to be the denotation of this other constituent will obviously play a role in when we predict the lf in (41b), and thus the sentence in (41a), to be usable. I will assume the following about the constituent that *always* attaches to.[6] I will assume that the constituent contains an index but the only purpose of this index is to restrict the domain of the function that we get out of this constituent. (This assumption isn't innocuous, and we will see that the contribution of the index plays a role in our reasoning about when (41a) will be felicitous.) The denotation of this constituent with respect to an assignment will be specifically as in (42b).

(42) a. always$_i$ $_\alpha$[ ... **i** ]
b. $[[ \alpha ]]^g$ =
λw: Ingrid is alive in w for the duration of g(i). Ingrid is Swedish-born in w.
(cf. Musan 1995)

The result is that the lf of (41a) will have a denotation as in (43), where S is the contextually salient set of time intervals,

(43) $[[$ (41b) $]]^g$ (w) = 1 as long as for all t in S, Ingrid is alive in w for the duration of t and Ingrid is Swedish-born in w.

and accordingly domain-variants of $[[$ (41b) $]]^g$ will be of the form

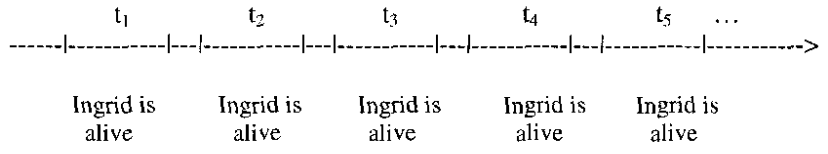
Δ(w) = 1 as long as for all t in σ, Ingrid is alive in w for the duration of t and Ingrid is Swedish-born in w.

Given this, we can derive (by making an additional assumption) that, *no matter what exactly the salient time intervals are, a speaker is not permitted to utter (41a).* This in turn means that a sentence like (41a) should always sound bizarre. Since it is hard to imagine an utterance of (41a) that sounds sensible, this prediction seems right.

[6] This can be seen as a minor change from what I have assumed so far in talking about *The student who finished first was always Swedish*, but it is not a change that affects the preceding discussion in any serious way.

In brief, the reasoning is as follows. Lfs of the kind in (41b) are the only ones that (41a) admits, so if a speaker is prevented from using those he can't use (41a). Now, I assume that an independent principle of grammar (I will elaborate briefly below) guarantees that a speaker is only allowed to use (41b) when it is already established that Ingrid is alive at all the intervals in the contextually salient set. But if it is already established that Ingrid is alive at all the intervals in the contextually salient set (and there is more than one interval in this set), a speaker who uses (41b) will violate (P). To see this, imagine first the information that the parties to conversation are taking for granted:

(44) a. $S = \{ t_1, \ldots, t_n \}$




Now consider the domain-variant of $[[(41b)]]^g$ whose domain consists only of $t_1$, the first time interval in the contextually salient set. (Call it Δ again.) Δ characterizes a world w as long as for all t in $\{ t_1 \}$, Ingrid is alive in w for the duration of t and Ingrid is Swedish-born in w. That is, it characterizes a world w as long as Ingrid is alive in w for the duration of $t_1$ and Ingrid is Swedish-born in w. Suppose we add to the diagram the information that Δ characterizes the actual world. This amounts to adding:

b. **Ingrid is Swedish-born**

and now from the information in the diagram we can conclude that $[[(41b)]]^g$ characterizes the actual world. Suppose instead we add to the diagram that Δ doesn't characterize the actual world. The only way of doing this consistently with the information already there is to add

c **Ingrid is not Swedish-born**

and from this we can conclude that $[[(41b)]]^g$ does not characterize the actual world.

(How about if there is only one interval in the contextually salient set? In this case, we will not be able to find a relevant domain variant of $[[(41b)]]^g$ whose domain is a *proper subset* of $[[(41b)]]^g$ 's domain, so (P) will not be violated. But the principle in (39) will be, so even in this case the speaker will be prevented from using the lf in (41b).)

The independent principle of grammar that I made use of in the course of my reasoning here is one that has been identified in discussions of "presupposition projection" (e.g. Heim 1983).[7] Given the domain condition in the denotation of the sister of *always* ( the denotation given in (42b)), this principle limits the conditions under which a speaker can use an lf that contains this constituent. Specifically, if the lf is one where this constituent combines with a quantifier (a quantifier coindexed with the index in this constituent), the speaker can only use the lf when it is being taken for granted that a certain property holds of every item in the set the quantifier ranges over. Without going into detail, in this case, where

[7] One formulation that will do for the purposes here is: Do not use [ $QUANT_i$ α ] to express that $[[ QUANT_i$ α $]]^g$ holds of w0 unless it is taken for granted about w0 that, for every x in the domain of $[[ QUANT_i$ α $]]^g$, $[[ \alpha ]]^{g\ i->x}$ (w0) is defined. See Percus 1998 for a version of the principle that is very close to this one.

the quantifier ranges over time intervals, every one of these time intervals must be one during which Ingrid is alive.

(45) Consequence of one view of "presupposition projection"and (42b):
A speaker is entitled to use (41b) to express that $[[\ (41b)\ ]]^g$ holds of w0 only when (46) is taken for granted.

(46) For every t in the domain of quantification for $[[\ (41b)\ ]]^g$ , Ingrid is alive in w0 for the duration of t.

**4.2**

The next case I want to consider is (47). Here as before, I will assume that there is just one possible kind of If, one in which *always* attaches to another constituent, and that this constituent is interpreted as in (48b).

(47) Napoleon was always dead.

(48) a. $always_i\ \alpha[\ \ldots\ \mathbf{i}\ ]$

b. $[[\ \alpha]]^g = \lambda w$. Napoleon is dead in w for the duration of g(i).

This means that the If of (47) will have a denotation as in (49), where S is the contextually salient set of time intervals.

(49) $[[(48a)]]^g = \lambda w$. for all t in S, Napoleon is dead in w for the duration of t

and accordingly domain-variants of $[[(48a)]]^g$ will be of the form $\lambda w$. for all t in $\sigma$, Napoleon is dead in w for the duration of t.

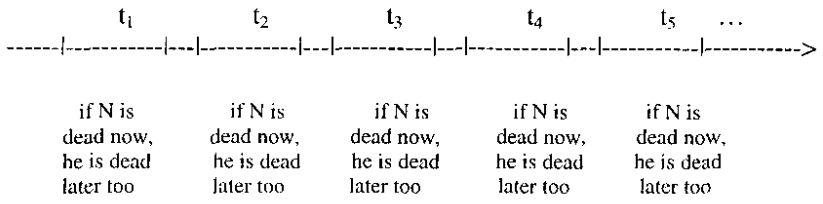
The fact is that, as with the previous sentence, it is hard to imagine an utterance of (47) that does not sound bizarre. My feeling is that when we try to imagine a speaker uttering the sentence, we have the impression that the speaker who utters it expects that at any moment Napoleon could have come back to life, as in "I kept checking the coffin, but Napoleon was always dead." That a speaker should expect something like this itself seems bizarre.

What we can derive on these assumptions about the syntax and semantics of (47) is that (47) will be unusable when it is taken for granted that anyone who is dead at one point is dead at all later points ((50)) – again, irrespective of what exactly those time intervals are that the context makes salient. This is because, no matter what set of intervals the context makes salient, a speaker who uses the If in (48a) while (50) is taken for granted will violate (P). Since Ifs of the kind in (48a) are the only ones that (47) admits, as long as (50) is taken for granted, a speaker will never be able to felicitously utter (47).

(50) Fact about the actual world w0:
For all x, t, t', if x is dead in w0 at t and t' contains no moment that precedes t then x is dead in w0 at t'.

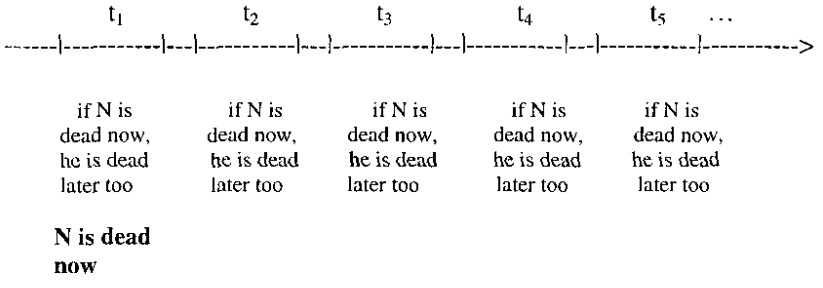
To see this, again imagine the information that is being taken for granted:

(51) a. $S = \{ t_1, \ldots, t_n \}$



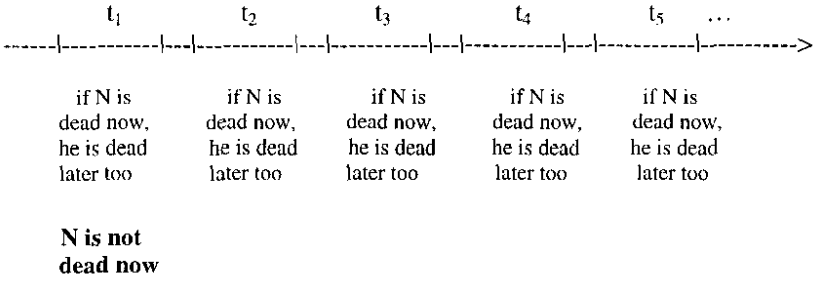

Now consider the domain-variant (call it Δ again) whose domain consists only of $t_1$, the first time interval in the contextually salient set. Suppose we add to the diagram the information that Δ characterizes the actual world:

b.




From this we can conclude that $[[(48a)]]^g$ characterizes the actual world. Suppose instead we add the information that Δ does *not* characterize the actual world:

c.




From this we can conclude that $[[(48a)]]^g$ does not characterize the actual world.

Here as in the previous case, the conclusion that (47) is unusable depends in part on the idea that the parties to conversation are accepting certain assumptions about the world. The relevant assumption here is that once you are dead, you're dead. Unlike in the previous case, however, there is no principle that links the acceptance of this assumption to the fact that the speaker has decided to use (47). Therefore, we predict that in cases where it is clear that the parties to conversation are *not* making this assumption, the sentence might not seem strange. Although we generally *do* accept that once you are dead, you're dead, stories about resurrection or about supernatural beings that come back to life suggest that one might choose not to accept this. Here is a case parallel to (47) in which the speaker specifically disavows the assumption that once you are dead, you're dead. The relevant clause here does not sound so bizarre, so this at least is consistent with the story we have told.

(52) Vampires are supposed to come back to life after midnight, but I checked the coffin every half hour and I can assure you that this vampire was always dead.

Here is a minimal pair that suggests that the story of the kind here is on the right track. It doesn't involve *dead* but rather *tall and blue-eyed.* A parallel account of (53) would yield roughly the following: if the parties to conversation presume that once you are tall and blue-eyed, you are tall and blue-eyed for good, then (53) will lead to a violation of (P). This is the kind of assumption that we might normally make, but not in a context where the speaker acknowledges the existence of supernatural forces, like witches' spells, that can induce shape-changing. (55) is a case where the speaker acknowledges the existence of such forces; (54) is a case where he doesn't. My impression is indeed that in (54) but not in (55), the last sentence comes as a bit of a surprise. It seems to suggest that the medication could have changed John's height or eye color, and this is not what we normally expect medication to be able to do.

(53) John was always tall and blue-eyed.

(54) The experimenters gave them a new medication every Tuesday evening. The next morning, the two of them generally looked in the mirror to see if it had had any effect on them physically. Ingrid went through quite a variety of changes over the weeks, without much of a common denominator. One week she would find that she was more muscular, the next week she would find that she was a little wrinkly. John, on the other hand, was always tall and blue-eyed.

(55) The witch cast a spell on them every Tuesday evening. The next morning, the two of them generally looked in the mirror to see what changes she had made to their appearance. Ingrid went through quite a variety of changes over the weeks, without much of a common denominator. One week she would find that she was large and muscular, the next week she would find that she was frail and wrinkly. John, on the other hand, was always tall and blue-eyed.

A variant of this case that is worth considering is the example in (56) – I assume that as before the only kind of If that the sentence has looks like (57a), that the denotation of this If is as in (58) and that accordingly domain-variants will be of the form λw. for all t in σ, Napoleon is alive in w for the duration of t.

(56) Napoleon was always alive.

(57) a. $always_i\ \alpha[\ \ldots \mathbf{i}\ ]$
b. $[[\ \alpha]]^g = \lambda w$. Napoleon is alive in w for the duration of g(i).

(58) $[[(57a)]]^g = \lambda w$. for all t in S, Napoleon is alive in w for the duration of t

Here we again derive that the sentence will be unusable when the speaker is taking for granted that anyone who is dead at one point is dead at all later points -- irrespective of what exactly those time intervals are that the context makes salient. However, this example is slightly different from the earlier one. In the absence of accepted knowledge about whether Napoleon was born yet at the time of the first interval, the kind of domain-variant that we need to consider in order to demonstrate a (P) violation is different from the kind we needed to consider earlier. It is one with a larger domain. Specifically, its domain must consist of *two*

intervals: the first interval and the last interval of the contextually salient set. (I leave it to the reader to verify this.) Now, the bizarreness of our old example (47) when judged in the absence of context suggests that in the absence of context we seem by default to take it for granted that once you are dead you're dead. So, given the proposal thus far, one might expect that this sentence too will sound bizarre when judged in the absence of context – but perhaps a little less bizarre. That seems to be the prediction.

**4.3**

In the case of the sentences we just looked at, anytime the parties to conversation are taking for granted the kind of assumptions that we all generally make about the world – for instance, that once you're dead you're dead – the speaker will violate (P). And this is true *irrespective* of what set of time intervals it is that the context makes salient. Accordingly, as long as we have no reason to think that the parties to conversation are departing from these normal assumptions,[8] we don't need to make any additional commitments as to what the salient set of time intervals is in order to reject the sentence as bizarre. At least, that is what follows from the picture I have presented so far.

The case of (61) (= (5)) is different. (I will assume as before that (61) has just one kind of If – given in (62a) – and that the denotation of this If is as in (63).)

(61) John always knows whether Ingrid is Swedish.

(62) a. $\text{always}_i\ \alpha$[ ... **i** ]
b. $[[\ \alpha]]^g = \lambda w.$ in w, John knows for the duration of g(i) whether Ingrid is Swedish[9]

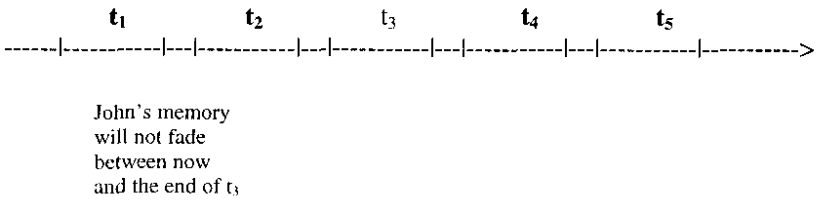
(63) $[[\ (62a)\ ]]^g = \lambda w.$ for all t in S, in w John knows for the duration of t whether Ingrid is Swedish

We would be able to say the same thing about (61) if we could maintain, for instance, that a normal assumption that we make about the world is that, once you know whether Ingrid is Swedish, you retain that knowledge forever. But I think that is not the kind of assumption that we normally make. We normally imagine that knowledge of this kind tends to fade, especially if you are never called upon to access it. In this case, if indeed the sentence sounds bizarre to us, that must have something to do with assumptions we are making about the set of time intervals that is being quantified over.

Here is the kind of situation in which we predict that a speaker who uses (61) will violate (P). We predict a violation of (P) when it is taken for granted that the distance between intervals is smaller than the amount of time that it would typically take for John's memory to fade. The idea is this: suppose it is taken for granted that, *if* John knows at interval $t_2$ whether Ingrid is Swedish, *then* he knows this also at the succeeding interval $t_3$.

[8] Or more precisely: as long as we have no reason to think that the speaker is assuming this kind of departure from normal assumptions.
[9] More precisely, to be consistent with the assumptions so far: Swedish-born.

(64) $S = \{ t_1, \ldots, t_5 \}$




Then to determine whether he knows *at all of the intervals in S* whether Ingrid is Swedish, it is enough to determine whether he knows *at all the intervals except* $t_3$ whether Ingrid is Swedish. Consequently, we can show that the use of the If (62a) violates (P) by considering a domain variant of $[[ (62a) ]]^g$ whose domain consists of all the intervals except $t_3$.

What this means is that, to the extent that we feel that the sentence is bizarre when we have no clue as to what the relevant time intervals are, we must be making some additional assumption along these lines: the distance between intervals is smaller than the amount it would take for John's memory to fade.[10] On the approach that I have been taking, this is the conclusion we are led to.

To test whether the approach is on the right track, what we should do is consider two kinds of scenarios, one where it is clearly taken for granted that the distance between intervals is smaller than the amount of time it takes for John's memory to fade, and one where it is clearly taken for granted that it is *larger*. A sentence like (61) should seem odd in the first scenario, but all right in the second. In fact, it is hard to think of any scenario where the kind of information that (61) conveys might be of interest, but the contrast between the following two dialogues might bear out the prediction. I think that the final sentence of the first dialogue sounds a lot worse than the final sentence of the second dialogue (where a natural paraphrase would use "remember" instead of "know"). When we hear the first dialogue, our first impression is that "always" is just redundant. If we try to justify it to ourselves, then if anything we have the strange feeling that the speaker thinks that the relevant information might suddenly vanish from John's mind, and when we know nothing else about John this comes as a surprise.

(65) -- I heard that Ingrid is Scandinavian, and I wanted to know whether she is Swedish.
-- For some reason this question comes up a lot. I always send people to John to find out. He isn't very knowledgeable, it's true, but he does always know whether Ingrid is Swedish.

(66) -- I heard that Ingrid is Scandinavian, and I wanted to know whether she is Swedish.
-- For some reason this question comes up a lot. I always send people to John to find out. He has a lousy memory for many things, but he does always know whether Ingrid is Swedish.

(A more realistic minimal pair might be as in (67)-(68), which I think behave similarly.)

(67) -- I was advised to buy a box of Fenistil, but I need to know first whether it contains antihistamines.

[10] Or more precisely: that the speaker is taking this for granted.

-- For some reason this question comes up a lot. Why don't you go ask the assistant pharmacist? He isn't very knowledgeable, it's true, but he does always know whether Fenistil contains antihistamines.

(68) -- I was advised to buy a box of Fenistil, but I need to know first whether it contains antihistamines.
-- For some reason this question comes up a lot. Why don't you go ask the assistant pharmacist? He has a lousy memory, it's true, but he does always know whether Fenistil contains antihistamines.

## 5 Consequences for "semantic partition"

Here is a very general pattern of reasoning. It starts from the claim that we do not use a sentence S to express the proposition that would be derived from an lf L.[11] It concludes on this basis that L is not a possible lf for a sentence S.

Now that we have seen that principles of pragmatics can prevent us from using an lf, we can see that this kind of reasoning is questionable. If we do not use a sentence to express the proposition that would be derived from an lf L, that could be because other principles prevent us from using L. It doesn't have to be because our mechanism for generating lfs prevents us from generating L for the sentence in question.

One place where this questionable pattern of reasoning has been used is in the treatment of sentences like *Ingrid was always Swedish.* We saw that there an independent principle of pragmatics, (P), could explain why we do not use an lf that contains an item coindexed with the quantifier. I want now to look at another case where this pattern of reasoning has been used, and ask if instead of saying that the sentence lacks an lf that we might otherwise expect, we can again say that while in principle we can generate this lf, in practice (P) will typically prevent us from using it.

The sentences that I am interested in are sentences with "individual-level predicates," and I am interested in the way they behave with respect to "semantic partition." Discussions of the syntax and semantics of sentences with singular indefinite subjects often start with the idea that sentences like (69) have among their possible lfs one that gives rise to a proposition like (70). They propose what that lf is and then argue that the parallel lf is not available for sentences like (71).

(69) A secretary is always on the phone.

(70) λw. For all intervals t in the set of intervals that the context makes salient,
there is some individual who in w is a secretary for the duration of t
and who in w is on the phone for the duration of t

(71) A secretary is always Swedish.

The argument follows the pattern of reasoning that I just sketched: We do not use a sentence like this to express the proposition that we would derive from the relevant lf. Therefore, the sentence does not have the relevant lf.

[11] I am using *proposition* here to mean a function from worlds to truth values. I am using *express proposition p* to mean "convey that p characterizes the actual world." See Section 3.

The kind of lfs that we are interested in are lfs like those in (72) and (73), or minor variants of these.

(72) always$_1$ [$_{VP}$ [$_{DP}$ $a_2$ secretary $e_1$ ] [$t_2$ on the phone $e_1$ ] ]

(73) always$_1$ [$_{VP}$ [$_{DP}$ $a_2$ secretary $e_1$ ] [$t_2$ Swedish $e_1$ ] ]

I have sketched in (74)-(76) a few aspects of the way these lfs are interpreted. Some things that are worth noting are that the indexed *e* items are silent items that function as variables over times, and that the DP functions as a quantificational expression with existential force.

(74) [[ [ [$_{DP}$ $a_i$ secretary $e_j$ ] $\alpha$ ] ]]$^g$
= $\lambda$w. there is some individual x
such that, in w, x is a secretary for the duration of g(j)
and such that [[ $\alpha$ ]]$^{g\ i->x}$ (w) = 1.

(75) [[ $VP_{(72)}$ ]]$^g$ = $\lambda$w. there is some individual x
such that, in w, x is a secretary for the duration of g(1)
and such that, in w, x is on the phone for the duration of g(1)

(76) [[ $VP_{(73)}$ ]]$^g$ = $\lambda$w. there is some individual x
such that, in w, x is a secretary for the duration of g(1)
and such that x is Swedish-born in w

The propositions that we would get out of these lfs are what I have written in (77) and (78). The lf in (72) would say that we can find a secretary on the phone at each of the contextually salient time intervals; the parallel lf in (73) would say that we can find a Swedish secretary at each of the contextually salient time intervals. The position I am examining has it that, while we can generate the lf in (72) for the sentence *A secretary is always on the phone*, we cannot generate the parallel lf in (73) for the sentence *A secretary is always Swedish*. Is this position justified?

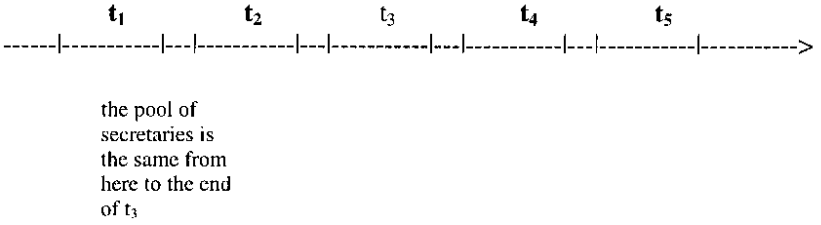
(77) [[ (72) ]]$^g$ =
$\lambda$w. For all intervals t in the set of intervals that the context makes salient,
there is some individual who in w is a secretary for the duration of t
and who in w is on the phone for the duration of t

(78) [[ (73) ]]$^g$ =
$\lambda$w. For all intervals t in the set of intervals that the context makes salient,
there is some individual who in w is a secretary for the duration of t
and who is Swedish-born in w

The point that I want to make is that, even if *A secretary is always Swedish* does have the lf in (73), the use of this lf will be very restricted. As long as we take it for granted that at two of the contextually salient time intervals exactly the same people are secretaries, (P) will prevent us from using it. Suppose for instance that it is accepted that the pool of secretaries is the same from, say, $t_2$ to the end of $t_3$; then (P) will prevent a speaker from using (73) by virtue of the domain-variant whose domain simply excludes $t_3$. This is because, to determine whether there is a Swedish-born secretary at each of the relevant intervals, it is enough to

determine whether there is a Swedish-born secretary at *every interval but* $t_3$. (By contrast, to determine whether there is a Swedish-born secretary *on the phone* at each of the relevant intervals, it is *not* enough to determine whether there is a Swedish-born secretary on the phone at every interval but $t_3$. So (P) will not prevent a speaker from using (72) in the same situation.)

(79) contextually salient set: { $t_1$, ..., $t_5$}




In fact, if the contextually salient time intervals are close together, it is pretty reasonable to imagine that the pool of secretaries will stay the same from one time interval to the next.

What does this mean? It means that, to the extent that we do not naturally take the sentence to express the proposition in (78) in the absence of information about the relevant time intervals, this might not be because the sentence lacks the lf in (73). It could just be because, in the absence of contrary information, we tend to imagine that the pool of secretaries will stay the same from one interval to the next – maybe because we tend to imagine that the intervals are close together. This kind of default assumption would be analogous to the kind of default assumption we considered at the end of the last section: namely that, in the absence of contrary information, we imagine that knowledge of whether Ingrid is Swedish will stay present from one interval to the next. If we really want to know whether the lf in (73) is a possible one, we should *at least* make sure to look at cases where it is clear that changes in the secretary pool occur between the contextually salient intervals, and cases like these will have to have intervals that are fairly far apart. A candidate case is (80). (To judge by the nods at the workshop,) it seems that (80) can convey that every change of office staff results in the inclusion of a Swede in the secretary pool, and this suggests that the lf in (73) is possible.[12, 13]

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[12] I think that there is an additional aspect of (80) that contributes to bringing out the reading I am interested in. This is the contrast between secretary and technical assistant. (On the natural way of pronouncing (80), there is pitch accent on both *technical* and *secretary*.) A near minimal pair (for me) that suggests that the contrast makes a difference is (i). The continuation in (a) is bizarre, suggesting that none of its possible lfs is appropriate. By contrast, the continuation in (b) is good and conveys that most staff reviews turn up a Swedish secretary.

(i) We require them to hire Swedes for as many positions as possible. With this in mind, we review their staff every year. In fact,

a. ?? a secretary is usually Swedish.

b. none of the technical assistants are ever Swedish. Still, a SEcretary usually is.

Significantly, I think, for the analysis of this contrast, replacing "a secretary" in (i a) by "one of the secretaries" redeems the sentence.

[13] One might imagine that the lfs for sentences like *Some secretary is always Swedish* or *At least one of the secretaries is always Swedish* yield propositions just like the one (73) yields. Suppose they do. I have suggested here that, in the case of (73), assumptions that we make in the absence of contrary information prevent us from using lfs like (73). Does this imply that these other sentences should sound odd in the absence of special information? The prediction here depends on other factors. When we are exposed to a sentence and find that (P) taken together with our natural assumptions rules out one of its lfs, we have various options other than rejecting the sentence. If the sentence has another lf that yields a different proposition, and that does not violate (P), we could decide to maintain our natural assumptions and to take the sentence as expressing that different proposition. Or we could decide to revise our assumptions. (In the case of sentences like (71), it has been

(80) Every five years, we change office staff entirely. We never wind up with any Scandinavians as technical assistants, but by sheer chance a secretary is always Swedish.

If this line of reasoning is right, there are still some questions to ask. But they have nothing to do with the lfs that (71) admits. The main question is why, when we ask ourselves whether it gives rise to the reading in (78), we have a strong tendency to imagine that the times being quantified over are close together rather than far apart. We seem not to exhibit this tendency, for example, when we ask ourselves what a sentence like (81) expresses. Here, we seem to imagine that there is only one relevant time interval per reign.[14]

(81) A blond is always King of Sweden, and a brunette is always Queen.

I want to close this section by mentioning a prediction that we can now make. I just said with regard to sentences like (71) that, when we have to guess what kind of time intervals might be under consideration, unless we know otherwise, we apparently do not imagine that changes in the secretary pool occur between the intervals. That is the conclusion we have to draw if (71) allows the lf in (73). As we saw earlier, we can draw a parallel conclusion from the fact that a sentence like *John always knows whether Ingrid is Swedish* sounds bizarre in the absence of information about the time intervals under consideration. The conclusion there is that, unless we know otherwise, we apparently do not imagine that changes in a person's knowledge as to whether Ingrid is Swedish can occur between the intervals.

When we put these two conclusions together with what we have said so far, we make a prediction. Consider the sentences in (82a) and (83a), which in some sense are parallel to the sentences we started out with in this section. On assumptions that can be reconstructed easily enough from the discussion thus far, one possible lf for (82a) – abbreviated in (82b) – yields the proposition in (82c), and similarly one possible lf for (83a) – abbreviated in (83b) – yields the proposition in (83c). The lf for (82a) says that, at each of the relevant time intervals, there is some secretary who knows at the time whether Ingrid is Swedish. The lf for (83a) says that, at each of the relevant time intervals, there is some secretary who knows at the time whether Ingrid is on the phone (at the time).

(82) a. A secretary always knows whether Ingrid is Swedish.
b. always$_1$ [$_{VP}$ [$_{DP}$ $a_2$ secretary $e_1$ ] [$t_2$ knows whether In. is Sw. $e_1$ ] ]
c. λw. For all intervals t in the set of intervals that the context makes salient,
there is some individual who, in w,
is a secretary for the duration of t
and knows for the duration of t whether Ingrid is Swedish

(83) a. A secretary always knows whether Ingrid is on the phone.
b. always$_1$ [$_{VP}$ [$_{DP}$ $a_2$ secretary $e_1$ ] [$t_2$ knows whether In. is on the ph. $e_1$ ] ]
c. λw. For all intervals t in the set of intervals that the context makes salient,
there is some individual who, in w,
is a secretary for the duration of t

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argued that another kind of lf is available, and so the first course is open. In the case of sentences like *Some secretary...*, perhaps this option is not available.)

[14] Parallel sentences with quantifiers like *half the time* might be of use in verifying this claim.

and knows for the duration of t whether Ingrid is on the phone

The prediction is this: in the absence of information about what time intervals are under consideration, it will not be natural to take (82a) to express the proposition that derives from that first If; by contrast, it should be natural to take (83a) to express the parallel proposition that derives from the second If. In other words, the "semantic partition" difference that we find between *A secretary is always Swedish* and *A secretary is always on the phone* should be preserved across this kind of attitude context. (Why do we make this prediction? Because, if at one time interval we can find a secretary who knows whether Ingrid is Swedish, then we should also be able to find such a secretary at another time interval – the very same secretary. So the relevant If for (82a) will violate (P). But if at one time interval we can find a secretary who knows whether Ingrid is on the phone, there is no guarantee that we can find such a secretary at another time interval. So the relevant If for (83a) will not violate (P).) This prediction seems to me to be correct. This is of interest because, contrary to what is often claimed, the ability to use Ifs like those in (82b)-(83b) apparently does not depend on the identity of the matrix verb: the matrix verb is the same (*know*) in both Ifs, but it looks as though the first If is usable while the second is not.

## 6 Concluding remarks

In this paper, I have argued for a conception of grammar under which principles of use may prevent us from availing ourselves of representations that we nonetheless have the resources to generate. I pointed out specifically that, since principles of use may sometimes block the use of Ifs, we have to be careful when arguing that a sentence does not admit such and such an If.

I tried to motivate a particular principle of use, (P), and my concern was to explore its effects. The questions that arise are the usual ones. Are there alternative lines of explanation that would have accounted for the same facts that I used (P) to account for? If indeed a theory that incorporates a principle like (P) is on the right track, is the relevant principle really (P), or is there a better way of formulating it? Does the principle follow from anything? Does it relate in any way to other principles of grammar that we know about?

To motivate (P), I used the fact that the sentence *The student who finished first was always Swedish* is unsuited to communicate the nationality of a certain student of whom it is known that she finished first each time. What other lines of explanation might one pursue to account for this fact? On the one hand, one might conjecture that the semantics of sentences like these is not what I claimed, and that the sentence's interpretation alone renders it incompatible with the situation in question. On the other hand, one might attribute the responsibility for this fact to other principles of use. One position to take, for example, is that it follows as a quantity implicature from the use of the sentence that the same student did not finish first each time. I can't address all the different options, but I am skeptical of this last position. To take this position is in part to say that we have a systematic way of generating alternatives to sentences like the one at issue, and that in the case of this sentence, the procedure will yield a sentence that is logically stronger and that entails that the same student *did* finish first every time. (One such alternative sentence might be: *The student who always finished first was (always) Swedish.*) I am skeptical because I do not see exactly how this procedure for generating alternatives would work.

Assuming something like (P) is on the right track, is the formulation of the principle in need of refinement? Probably. For one thing, some provision has to be made somewhere for the communicative intentions of the speaker: while in the scenario considered it is odd to utter

*The student who finished first was always Swedish* in order to communicate the student's nationality, it is not so odd to utter the sentence in order to communicate a simple statistical generalization. Maybe a better formulation of the principle would reflect this. Apart from this, I think there is a further inadequacy with (P) and (Q) as they stand now. They predict that sentences of the kind in (84) should have the same status, when my intuition is that (84b) is less bizarre than (84a). (While I haven't come up with a context in which (84b) sounds perfect, my impression is that it evokes the kind of scenario in which someone checks every so often to see whether Napoleon has died.) They predict that the two sentences should have the same status because, in both cases, one can determine the sentence's truth by determining the truth of a domain-variant whose domain consists of a single time interval – in the case of (84a), the relevant time interval is the earliest one in the contextually salient set, and in the case of (84b) it is the last one. Accounting for the difference between (84a) and (84b) would certainly mean revising (P), perhaps in such a way as to take into account the chronological order (or some other natural ordering) of the time intervals in the domain of quantification.[15]

(84) a. Napoleon was always dead.
b. Napoleon was never dead.

There is another potential refinement worth mentioning: since my concern in this paper has been exclusively with adverbial quantifiers, I have formulated (P) to account only for facts involving adverbial quantifiers, but naturally (P) should be extended to cover parallel facts involving quantifier phrases in other positions. If I tell you (85) alluding to the Marx Brothers, that sounds as odd as telling you *The student who finished first was always Swedish* when we know that the same student finished first each time. Presumably it sounds odd for the same reason.

(85) Each one's mother was named Minnie.

Is there any connection between the principle of use that I have argued for, and anything else that we know about? As a pragmatic principle, (P) looks very different in character from certain others that have been posited, in that it compares propositions that are equally informative. Perhaps it could be viewed as a subcase of Grice's Maxim of Manner ("Be brief.") (Its effect is radically different from the effect of the Maxim of Quantity, since, of the propositions it compares, it instructs the speaker to reject the logically stronger ones.) As for the facts that (P) is designed to account for, there do seem to be facts that bear a surface similarity: the bizarreness of sentences like those in (86) is reminiscent of the bizarreness of the familiar sentences in (87).

(86) a. ?? At that time, Ingrid was Swedish.
b # On Tuesday, the student who finished first was Swedish.
(given our second scenario)

[15] There are many candidates to think about. Here is an example (whose predictions I haven't thought about). Starting from a salient (strong) linear ordering of the intervals in the domain of quantification of $[[\ \text{QUANT}_i\ \alpha\ ]]^g$, establish a corresponding ordering of those domain-variants whose domain consists exclusively of a single element of that set. (For instance, if the domain of (84a) is {March 1810, April 1810, May 1810,...}, order *λw. in w Napoleon was dead for the duration of March 1810* before *λw. in w Napoleon was dead for the duration of April 1810* before *λw. in w Napoleon was dead for the duration of May 1810*, etc.) New principle: Don't use $[[\ \text{QUANT}_i\ \alpha\ ]]^g$ if the truth of one of these domain-variants guarantees the truth of the next domain-variant in the order.

(87) a. ?? Ingrid was always Swedish.
b. # The student who finished first was always Swedish.
(given our second scenario)

(P) does not account for the bizarreness of the sentences in (86). Since it is tempting to think that the problems with (87) can be reduced to the problems with (86), superficial similarities like these might lead one to pursue an approach very different from the one I have taken here.[16, 17]

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[16] Some inspiration for an alternative approach might come from the idea that verifying sentences like those in (87) involves verifying many nonquantificational sentences of the kind in (86).

[17] It is natural to diagnose the oddness of (86) as resulting from a conflict with a quantity implicature. To evaluate this diagnosis, it might help to have a good description of the conditions of use of sentences with temporal adverbs. I think giving such a description is not so straightforward (Percus 1997 contains an attempt, and lists some of the relevant facts).

# What are Incremental Themes?

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## Abstract

In this paper I examine the approach to incremental themes developed in Krifka 1992,1998, Dowty 1991 and others, which argues that the extent of a telic event is determined by the extent of its incrementally affected theme. This approach identifies the defining property of an accomplishment event as being the fact that the theme relation is a homomorphism from parts of the event to parts of the (incremental) theme. I show that there are a large number of accomplishments, both lexical and derived via resultative predication, which cannot be characterised in this way. I then show that it is more insightful to characterise accomplishments in terms of their internally complex structure: an accomplishment event consists of a non-incremental activity event and an incrementally structured 'BECOME' event, which are related by a contextually available one-one function in such a way that the incremental structure of the latter is imposed on the activity.

## 1 The Question of Incremental Themes

In this paper, I want to address the question of incremental themes, to discuss what they are and what role they play in determining the aspectual class of the VP in which they occur. Incremental themes surfaced in linguistics discussion notably in work of Tenny 1987, 1994, Dowty 1991, and most importantly in the work of Krifka 1989, 1992, and 1998. The basic idea is that some arguments of verbs, such as the direct object argument of the verbs eat and mow in (1) are used up 'bit by bit' as the event denoted by the verb progresses.

(1) a. Mary ate the sandwich.
b. Jane mowed the lawn

One can plot the progress of the event of Mary eating the sandwich by looking at changes in the sandwich, and similarly the progress of the event of Jane mowing the lawn can be plotted by watching changes in the lawn. As Dowty 1991 puts it "if I tell my son to mow the lawn (right now) and then look at the lawn an hour later, I will be able to conclude something about the "aspect" of the event of his mowing the lawn from the state of the lawn, viz., that the event is either not yet begun, partly done but not finished, or completed, according to whether the grass on the lawn is all tall, partly short or all short. On the other hand I will not necessarily be able to inspect the state of my son and conclude anything at all about his completion of his mowing the lawn. In this event, my son is the Agent and the lawn is the Theme, in fact the Incremental Theme." Formally, Krifka has argued, there is a homomorphism from the parts of an incremental theme to the parts of the event of which it the theme.

Incremental themes are argued to be relevant in the literature in two domains; in the theory of thematic roles and the theory of aspect. Dowty 1991 argues that being an incremental theme is a property typically associated with patient arguments. Thus it is one of the properties on his 'cluster' list for contributing properties for the role of proto-patient. But a far more central role has been claimed for it in the determining the aspectual properties of

VPs. Verkuyl 1972 and Dowty 1979 both noticed that accomplishment predicates behave as telic or non-telic depending on the properties of the direct object. The contrast between the examples in (2) and those in (3) show that while activity predicates always behave as activity predicates no matter what direct object they have, accomplishment predicates behave as activities when the direct object is a bare plural or a mass NP.

(2) a. John pushed the cart for an hour/#in an hour.
b. John pushed carts for an hour/#in an hour.

(3) a. Mary built the house #for a year/in a year.
b. Mary built houses for a year/#in a year.

Krifka argues that the fact that the theme is incremental and that there is a homomorphism from the denotation of the theme to the event means that the 'quantized' properties of the direct object percolate up to the VP of which it is part and allow the quantized or non-quantized status of the VP to be determined by the direct object. When the direct object denotes quantity of a determined or determinable size and there is such a homomorphism, the telic point of the whole event is identifiable, and the event behaves like an accomplishment. But when the size of the denotation of the direct object is undeterminable because the NP expression is mass or a bare plural, no telic point is identifiable for the event, despite the homomorphism, and the event has the characteristics of a non-telic activity. Tenny's notion of the direct object 'measuring out' the event captures essentially the same idea.

In this paper, I want to examine more closely the role of incremental themes in determining the aspectual properties of the event. I will start by examining some problems which Krifka 1992, 1998 himself brings up. I shall show that the problem extends to lexical accomplishments such as *repair the computer*. Then, drawing on my 2000a analysis of resultative constructions, I will argue that derived resultatives such as *sing the baby asleep* and *clap the players off the stage*, as in (4), provide further evidence that the themes of events cannot always be incremental in the way that Krifka suggests.

(4) a. John sang the baby asleep
b. The audience clapped the players off the stage.

In the final part of the paper I shall argue that the determining property of accomplishments is not the homomorphism between theme and event that Krifka describes (although it is sufficient to characterise an event predicate as an accomplishment). Instead, the crucial property is that an accomplishment is associated with an activity event and a gradual change of state, or BECOME event, the culmination of which determines the telic point of the accomplishment.

## 2 Activities vs. accomplishments

I assume (for the moment) that activities and accomplishments have the internal structures in (5):

(5) **activities:** $\lambda e.\ (\text{ACTIVITY}(P))(e)$
**accomplishments:** $\lambda e.\ \exists e_1 \exists e_2 [e = e_1 \sqcup e_2 \wedge (\text{ACTIVITY}(P))(e_1) \wedge \text{cul}(e) = e_2]$

The culmination (cul), or telic point is the point at which the event is completed, the point at which there is enough of the event for the predicate to apply correctly to it. It is usually agreed (see discussion in Dowty 1979) that the arguments of $e_1$ are the arguments normally associated with the verb: the argument of the culmination event $e_2$ is the theme or patient of the verb. Thus, in (6) the endpoint of the event is determined by what happens to the house, namely it gets built, and not by what happens to the agent of the action, Mary:

(6) Mary built the house.

An obvious question is whether verbs should properly be assigned to aspectual classes, or whether the classification should apply to Verb Phrases. Following Dowty 1979, who argues that VPs where the modifier is *in x time* are accomplishments and VPs where the modifier is *for x time* are activities, the examples in (7) and (8) make it look as if the answer should be VPs. (cf. Dowty 1979, Krifka 1992, 1998, Tenny 1987, 1994 and others):

(7) a. John walked for an hour.
b.#John walked in an hour.
c. #John walked a mile for an hour.
b. John walked a mile in an hour.

(8) a.#John built a house for a month
b. John built a house in a month.
c.#John built houses in a month.
d. John built houses for a month.

The data in (7a/b) show that *walk* is an activity verb, but (7c/d) show that *walk* can head a VP which is an accomplishment. Conversely in (8a/b) we see that *build a house* is naturally an accomplishment, while the same verb *build* can head an activity VP when the direct object is a bare plural. However, the data in (9) contrast with (8):

(9) a. John pushed a cart for an hour.
b.#John pushed a cart in an hour.
c. John pushed carts for an hour.
d.#John pushed carts in an hour.

While *build* apparently allows the properties of the direct object to determine whether it heads an accomplishment or an activity VP, (9) shows that *push* heads an activity VP independent of the properties of its direct object. So, we can in principle distinguish between those verbs which allow the grammatical properties of the patient/theme argument to determine their

telicity (accomplishments) and those which don't (activities). The question then is what is the basis of that distinction.

## 3 Krifka's theory of quantization

Krifka 1992, 1998 argues that predicates can be characterised as cumulative or quantized

(10) **cumulative predicates**:

$\forall X\,[CUM(X) \leftrightarrow \exists x\,\exists y\,X(x) \wedge X(y) \wedge \neg\, x{=}y] \wedge \forall x \forall y\,[X(x) \wedge X(y) \rightarrow X(x \sqcup y)]]$
"If a predicate X is cumulative, then if X applies to x and y it will also apply (non-trivially) to the sum of x and y."

Examples of cumulative predicates are *water* or *apples*: if x and y fall under *apples*, then the sum of x and y also fall in the denotation of *apples*.

(11) **quantized predicates**

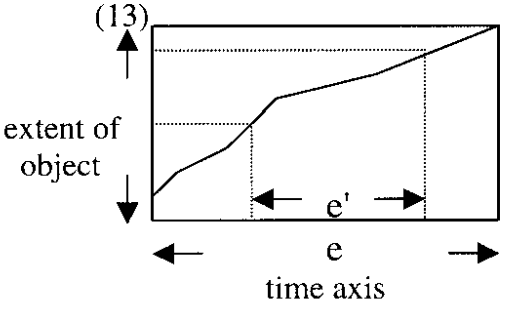
$\forall X\,[QUA(X) \leftrightarrow \forall x \forall y[X(x) \wedge X(y) \rightarrow \neg\, y < x]]$
"If X is quantized, then if x and y fall under X, y cannot be a proper part of x.

An example of a quantized predicate is *three apples*: if x falls under *three apples* it cannot have a proper part which is also *three apples*. Krifka 1992, 1998 argues that if a verb has the appropriate relation with its theme, then the quantized/non-quantized status of the theme determines whether the VP is quantized (telic) or non-quantized (atelic), as illustrated in (12):

(12) a. John ate apples for an hour.
b. #John ate apples in an hour.
c. #John ate 3 apples for an hour.
d. John ate 3 apples in an hour.

The 'appropriate relation' is determined by the relevant thematic role. Thematic roles are functions from events to their participants, (Parsons 1990, Landman 2000), and the feature [± quantized] percolates from the theme NP to the VP if the function expressed by the thematic role 'theme' is a homomorphism from the event to its theme/patient participant, as represented in (13), taken from Krifka 1992.

(13)




Krifka 1998 shows that a thematic role θ is a homomorphism from the event to the object if it has the following properties, (under the assumption that each thematic role has a unique value) (Krifka 1998):

- *mapping to subevents*:
  $\forall x,y,\forall e\ [\theta(e,x) \wedge y < x \rightarrow \exists!e'[e'<e \wedge \theta(e', y)]]$
  "if x is the theme of e and y is a proper part of x, then there is some unique proper part of e which has y as it theme".

- *mapping to subobjects*:
  $\forall x\ \forall e,e'\ [\theta(e,x) \wedge e' < e \rightarrow \exists y[\ y<x \wedge \theta(e', y)]]$
  "if x is the theme of e and e' is a proper part of e, then there is some (unique) proper part of x which is the theme of e'". (Here note that uniqueness follows from the general properties of $\theta$.)

Together these properties constitute what Krifka 1992 calls 'graduality', and Krifka 1998 calls incrementality. Krifka thus explains how quantized DPs lead to telic events: graduality means that if each subevent of e has a different unique part of x as its theme, and each part of x is the theme of a unique part of e, and if each part of x can be the theme of no more than one event, then at some point the object will be used up; this is the culmination point, the point at which the event is over. An event is telic if the linguistic expression of the theme of e gives enough information to determine the size of the object which is the theme, and thus the point at which it will be used up. So graduality is a necessary condition for telicity, and graduality plus a quantized theme is sufficient. Thus in (14a) and (14b), the thematic role 'theme' is gradual. But (14a) is non-telic although the thematic role 'theme' is gradual or incremental because the direct object cannot be used to identify a telic point; put differently, the description of the event does not include information about when the culmination occurs. (14b), on the other hand does give such information; the event under discussion is over when the eating of three apples was completed. And because there is such a difference between (14a/b), the verb *eat* is considered to belong to the class which denotes accomplishment events. In contrast, *push* does not have a gradual theme, and thus both (14c) and (14d) are non-telic independent of the quantized or non-quantized status of the theme argument. So, *push* denotes an activity event:

(14) a. John ate apples last night.
b. John ate three apples last night.
c. John pushed carts last night.
d. John pushed three carts last night.

## 4 Problems with Krifka's approach

Krifka brings up a number of problems for his theory of quantization, and suggests solutions to them. He shows that there are VPs such as *peel an apple* where what determines the extent of the event is not the extent of the whole theme of the V (the apple), but only the extent of an aspect of it, namely its outside surface which determines the extent of the peeling event. There are also cases where events have parts which do not directly affect a part of the theme: thus in an event of building a house there is the stage at which you put up the scaffolding and the point at which you take it down again; in neither case is the extent of the house affected by the event at that stage. A more serious problem which Krifka 1998 discusses are events like *read War and Peace* which can 'affect' the same part of the object more than once, since the reader can go back and read, say, chapter 1 many times in the course of reading the book. Here, the suggestion is that although an event e of this kind may not be incremental in the

strict, non-repetitive sense, there is an 'idealised' event which can be defined in terms of e which is strictly incremental.

Here, though, I want to mention three other problems which are a problem for the homomorphism theory of telicity. The first problem concerns minimal pairs such as (15):

(15) a. John wiped the table/polished the vase in five minutes.
b. John wiped the table/polished the vase for five minutes.

If telicity is determined by the graduality of the theme, then we assume from (15a) that *wipe* and *polish* assign gradual themes. But in (15b) we see that exactly the same VP can also be treated as non-telic. Unless we assume that the verb assigns two different thematic roles in each example in (15), one gradual and the other not, we need to ask why in the one case the quantized direct object determines a culmination point and in the other it doesn't.

The second problem are examples which are clearly telic, but in which intuitively it makes no sense to see the shape of the event as define by the 'extent' of the direct object incrementally. Here are some examples:

(16)

| | |
|---|---|
| repair the computer | teach the child |
| spice the soup | close the suitcase |
| wash the clothes/shirt | close the door |
| solve the rubik's cube | lock the door |
| prove the theorem | dry the clothes. |

Repairing a computer, for example, frequently does not involve affecting the computer incrementally, but rather fiddling around with it and trying various things until you hit on the cause of the problem and thus its solution. Washing the clothes or the shirt does not affect the extent of the clothes or the shirt bit by bit: the event is not over when the last part of the last item of clothing or the last part of the shirt is washed. All the clothes are put in the machine together and washed together when the last stage of the process (washing rinsing spin-drying) is over. Similarly an event of closing the door does not affect the door incrementally: what is incremental is movement of the door over the path or space which it is necessary to cross to get from being open to being closed.

The third problem for a homomorphism theory of telicity is an extension of the second problem and concerns transitive and intransitive derived resultatives. In what sense could the 'extent' of the direct objects in (17) dictate the 'extent' of the event?

(17) a. John sang the baby asleep.
b. The audience booed the player of the stage.
c. The dog scratched the wound open.

If a baby falls asleep gradually it is not a gradualness which affects its extent incrementally. It does not fall asleep feet first and then legs and then torso; put differently, the size of the baby does not affect the extent of the event of singing it to sleep. Similar arguments can be made for (17b). In (17c) the extent of the wound does not affect how long the event took at all. (17c) can be true if the dog scratched and scratched at one part of a big wound so that it opened at that point, irrespective of what happened to the rest of it. Note crucially that the direct objects here behave as themes with respect to quantization:

(18) a. John sang the baby asleep in ten minutes/#for ten minutes.
b. John sang babies asleep #in half an hour/for hours last night.

So if the culmination point of an accomplishment is not determined by the extent of the incremental theme, what does determine it? And if the incrementality of the accomplishment is not determined by the way in which the incremental theme is 'used up', then what makes an accomplishment incremental?

## 5 A Closer look at Resultatives

The kinds of examples we are interested in this section are given in (19):

(19) a. Mary painted the house red.
b. John wiped the table clean.
c. Mary hammered the metal flat.
d. John sang the child$_j$ asleep$_j$.

A resultative predicate expresses a property which is true of the culmination of the matrix event. So a plausible paraphrase of (19a) is "Mary painted the house, and at the culmination of the painting event the house was red."

I give a detailed analysis of these constructions in Rothstein 2000a, and here I will explain the major points which are relevant for our discussion of incremental themes. Resultative predication, like depictive predication, sums the eventuality denoted by the matrix verb with the eventuality denoted by the secondary predicate. The condition on the summing, which gets the interpretation that we want, is that the culmination of the matrix event is PART-OF the eventuality expressed by the secondary predicate, where 'PART-OF' is defined as in (20):

(20) PART-OF($e_1$,$e_2$,y) iff (i) $\tau(e_1) \sqsubseteq \tau(e_2)$ (i.e. $e_1$ is temporally contained in $e_2$ ); and
(ii) $e_1$ and $e_2$ share a thematic argument, y

'PART-OF' is not the standard part-of relation, defined in terms of the sum operation, forming a partial order, but is a non-transitive relation which identifies one atomic eventuality as inherently connected to, or part of, another eventuality. Its analogy in the domain of individuals is the part-of relation which holds between John and his hand, which is non-transitive, but which allows John and his hand to be treated as atoms of equal weight for summing in conjunctions such as (21):

(21) Holistic doctor to John: "I can't just treat your hand. I have to treat both your hand and you."

The formal operations and derivations are given in (22)-(24). (I follow Rothstein 2000b in treating meanings of verbs as expressions in which the subject variable is free and abstracted over by an operation of predicate formation at the VP level. Transitive verbs denote expressions of type <d,<e,t>> (where d is the type of individuals and e the type of events), and are of the form $\lambda y \lambda e.V(e) \wedge \theta_1(e)=x \wedge \theta_2(e)=y$, while intransitive verbs denote expressions of type <e,t>, of the form $\lambda e.V(e) \wedge \theta_1(e)=x$.

(22) Summing operation for resultative secondary predication
$RSUM[\alpha,\beta] = \lambda y \lambda e.\exists e_1 \exists e_2[e=(e_1 \sqcup e_2) \wedge \alpha(e_1,y) \wedge \beta(e_2,y) \wedge \text{PART-OF}(\text{cul}(e_1),e_2,y)]$

(23) [paint red]$_{VP}$ $\rightarrow$
RSUM[$\lambda y \lambda e$.PAINT(e) $\wedge$ Ag(e)=x $\wedge$ Th(e)=y, $\lambda x \lambda e$.RED(e) $\wedge$ Arg(e)=x ]
= $\lambda y \lambda e . \exists e_1 \exists e_2 [e=(e_1 \sqcup e_2) \wedge$ PAINT($e_1$) $\wedge$ Ag($e_1$)=x $\wedge$ Th($e_1$)=y
$\wedge$ RED($e_2$) $\wedge$ Arg($e_2$)=y
$\wedge$ PART-OF(cul($e_1$),$e_2$,y)]

(24) [Mary paint the house red]$_{IP}$ $\rightarrow$
$\exists e \exists e_1 \exists e_2 [e=(e_1 \sqcup e_2) \wedge$ PAINT($e_1$) $\wedge$ Ag($e_1$)=MARY $\wedge$ Th($e_1$)= THE HOUSE
$\wedge$ RED($e_2$) $\wedge$ Arg($e_2$)=THE HOUSE
$\wedge$ PART-OF(cul($e_1$), $e_2$,THE HOUSE)]

The PART-OF condition guarantees that that cul($e_1$) and the resultative predicate must share an argument. I assume (essentially following Dowty 1979 and others, such as Tenny 1987) that the argument of the culmination event is the theme, or the affected entity). By the PART-OF condition, the theme must also be the argument of the resultative. (Thus the so-called 'direct object restriction', which states that the resultative must be predicated of a direct object, turns out to be a condition that resultatives must be predicated of themes, and this itself is explained in terms of the PART-OF condition.)

Given that the resultative predication rule requires the event introduced by the matrix verb to have a culmination, the question is how resultative predicates can occur with activity verbs, either the transitive kind, as in (19b/c), or the intransitive kind, as in (19d).

I assume that a single rule of resultative interpretation applies whether the matrix verb is an activity or accomplishment, and thus in (19b-d) the result predicate adds information about the culmination of the event determined by the matrix verb.

I assume that there is a culmination modifier of type <<e,t>,<e,t>>, which can be added to activities, and which specifies that the argument of cul(e) is the incremental theme of e:

(25) $\lambda E.E(e) \wedge \exists e'[cul(e)=e' \wedge Arg(e')=Th(e)]$,

This modifier denotes a function from activities to accomplishments: in other words applying the function in (25) to an activity yields an accomplishment predicate. When applied to the verb *wipe*, in (26a), the culmination modifier gives the verb meaning in (26b).

(26) a. $\lambda y \lambda e$. WIPE(e) $\wedge$ Ag(e)=x $\wedge$ Th(e)=y
b. $\lambda y \lambda e$. WIPE(e) $\wedge$ Ag(e)=x $\wedge$ Th(e)=y $\wedge \exists e'[cul(e)=e' \wedge Arg(e')=Th(e)]$

This presence of this culmination modifier is what distinguishes between activity and accomplishment readings of *wipe the table/polish the vase* in (15), repeated here:

(15) a. John wiped the table/polished the vase in five minutes.
b. John wiped the table/polished the vase for five minutes.

The V' *wipe the table* is ambiguous between (27a/b), with (27b) being used in (15a) and (27a) being the interpretation of the activity V' in (15b). As we would predict, only (27b) can be used in the resultative, and we assume that the presence of the resultative forces the interpretation in (26b/27b) to be used:

(27) a. $\lambda e.$ WIPE(e) $\wedge$ Ag(e)=x $\wedge$ Th(e)=THE TABLE
b.$\lambda e.$ WIPE(e) $\wedge$ Ag(e)=x $\wedge$ Th(e)=THE TABLE $\wedge \exists e'$[cul(e)=e' $\wedge$ Arg(e')=Th(e)]
c.#John wiped the table clean for ten minutes.
d. John wiped the table clean in ten minutes.

(27b) is paraphrased as: "There was an event of John wiping the table and the culmination of that event was PART-OF the event of the table being clean, and the culmination of the event was within ten minutes." Again, the theme of the matrix verb is the argument of the culmination relation, and of the resultative. Adding the culmination modifier is thus equivalent to type shifting the verb from one aspectual class, the class of activities, to another, the class of accomplishments.

With intransitive resultatives, as in (19d), not only must the verb be shifted from one aspectual class to another, but its (argument) type must be shifted so that the matrix verb has the right number of arguments to sum with resultatives: I assume the following:
- the resultative triggers the addition of the culmination modifier.
- the culmination modifier, which requires its argument to be the theme of the matrix verb, triggers the type shifting operation on the intransitive matrix verb in (28), and the interpretation of (19d) is as in (29):

(28) resultative shift (R-SHIFT):
R-SHIFT($\lambda e.$V(e) $\wedge$ Ag(e)=x) = $\lambda y \lambda e.$V(e)$\wedge$Ag(e)=x $\wedge \exists e'$[cul($e_1$)=e' $\wedge$ Arg(e')=y]

(29) John sang the baby asleep.
$\exists e \exists e_1 \exists e_2$[e=($e_1 \sqcup e_2$)
$\wedge$ SING($e_1$) $\wedge$ Ag(e)=JOHN $\wedge \exists e'$[cul($e_1$)=e' $\wedge$ Arg(e')=THE BABY
$\wedge$ ASLEEP($e_2$) $\wedge$ Arg(e)=THE BABY
$\wedge$ PART-OF(cul($e_1$),$e_2$,THE BABY)]
"There was an event which was the sum of a singing event and an event of the baby being asleep, and the culmination of the singing event was PART-OF the event of the baby being asleep".

PART-of(cul($e_1$),$e_2$,y) forces cul($e_1$) and $e_2$ to share an argument; thus the culmination of the singing event must have THE BABY as its argument. But, if THE BABY is the argument of cul($e_1$), then by definition, it must be the theme of $e_1$. It is a peculiar kind of theme argument, since its relation with V is not defined by a standard participant role - by which I mean that the in (19d/29) the verb *sing* cannot be said to assign a theta-role to the direct object, as we can see from the ungrammaticality of (30):

(30) *John sung the baby.

The peculiarness of the argument shows up in the contrasts in (31), noted originally in Rothstein 1992:

(31) a. Which table did you ask whether John wiped t clean?
b.??Which baby did you ask whether John sang t asleep?

Chomsky 1986 argues that wh- extractions may violate subjacency if they are from a position directly theta-marked by a head. What we see in (31a) is that extraction from a transitive resultative construction which violates subjacency is acceptable, whereas extraction from the parallel position in an intransitive resultative construction is not good. This contrast is

explained (in Chomsky's theory) on the assumption that the trace in (31a) is in a position directly theta-marked by transitive *wipe,* while in (31b) the trace is not thematically marked by the intransitive V *sing.* Nonetheless, and this is the crucial point which makes the discussion in this section relevant, these non-theta-marked nominals are predicted by our theory to be themes of the verb, and they behave as such. Thus the NP *the baby* behaves as the incremental theme in the following crucial sense: the quantized or non-quantized status of this argument determines whether the VP is telic or non-telic, as shown in (32):

(32)a. John sang the babies asleep in half hour /#for half an hour last night.
b. John sang babies asleep #in half hour/for half an hour last night.

Furthermore, our theory of resultatives applied to (19d), and as expressed in (29), involves assigning a culmination to a singing event and requires us to analyse *the baby* as the argument of this culmination, and thus the incremental theme of the complex derived accomplishment. The point is that in this resultative construction the activity *sing* has shifted into an accomplishment which has a culmination of which *the baby* is the argument. What sort of accomplishment is it? What does it mean to say that the singing event had a culmination? And, most important for us here, what does it mean to say that the baby, as the argument of the culmination, must be the incremental theme of the singing event?

## 6 Back to Incremental Themes

What might incremental themes be? If, as I have been suggesting, they are the arguments of culminations, then in order to give an answer we need first to answer the question what are culminations? There are three obvious possible answers that I know of:

- the culmination of an event e is **determined by the extent of a bounded object of e.** A culmination occurs when the object occurs when the object is 'used up' in the event.

- the culmination of e is the **result state**, or the beginnings of result state, brought into being by the action determined by the matrix verb.

- the culmination of e is an achievement event, or minimal change of state associated with the end point of e.

We have already argued in section 4 that the first approach to culminations cannot be correct. What about the other two approaches? Both are implicitly involved in Dowty's 1979 account of accomplishments: this gives the template for accomplishments in (33a), translated into an event-argument framework as in (33b), which incorporates the twofold claim that accomplishments consists of an activity event and a BECOME event and that they are related via a causal relation:

(33) a. [ACTIVITY(P) [CAUSE [BECOME (P')]]]
b. $\lambda e.\exists e_1 \exists e_2[e= e_1 \sqcup e_2 \wedge (\text{ACTIVITY(P)})(e_1) \wedge (\text{BECOME(P')})(e_2) \wedge \text{CAUSE}(e_1,e_2)]$

The two parts of the claim are not inherently related: it is plausible - and in fact correct - to argue that the structure of an accomplishment is complex, consisting of an activity part and a BECOME event as in (33b), but that the relationship between them is not causal.

The fact that the relation between the activity and the culmination is not causal and that the culmination is not the result of the activity can be seen very clearly from accomplishments derived by resultative predication as in (34):

(34) a. On May 5 1945, the people of Amsterdam danced the Canadians to Dam Square.
b. Reluctant to let him go, the audience clapped the singer off the stage.
c. At the opening of the new Parliament building, the crowd cheered the huge gates open.
d. Mary drank John under the table/sick/dizzy.
e. Every night the neighbour's dog barks me asleep.

In these examples, the activity does not cause the result: in (34a) the people of Amsterdam do not cause the Canadians to get to Dam Square by dancing: the Canadians were going there anyway. In (34b) the audience did not cause the singer to leave the stage by clapping; on the contrary, they would probably have been happy if their clapping had managed to prevent the singer from leaving the stage. The examples in (34c-e) give similar examples with AP resulative predicates instead of PP predicates. Sometimes, intransitive resultatives do imply a causal relation between the activity and the result, but this is a matter of pragmatics, as the minimal contrast between (34b) and (35), which does have a causal implication, shows:

(35) The audience hissed/booed/laughed the singer off the stage.

But, if culminations are not result states caused by the activity, we are left with the idea that a culmination is some minimal event which indicates the end of the activity. This fits in with the conceptually attractive idea that activities and achievements are the two basic kinds of non-stative events, and that the complex accomplishment is constructed out of a sum of an activity and an achievement.

If we take the 'CAUSE' relation out of the representation in (33b), we are left with (36):

(36) $\lambda e.\exists e_1 \exists e_2 [e = e_1 \sqcup e_2 \wedge (\text{ACTIVITY}(P))(e_1) \wedge (\text{BECOME}(P'))(e_2)]$

Since Dowty 1979 suggests that achievements are to be represented as having a BECOME component, it looks at first sight as if (36) represents exactly what we want, namely that an accomplishment consists of an activity $e_1$, and an achievement, $e_2$. However, this would be a misreading of Dowty's claim that accomplishments contain a BECOME component, since Dowty is explicit about the fact that the BECOME part of an accomplishment takes place over an extended period of time, while achievement BECOME events are near-instantaneous. And if the BECOME event in (36) takes place over an extended period of time, then $e_2$ in (36) cannot be the telic point, or culmination event we are looking for.

What I want to suggest is that Dowty's original suggestion that accomplishments involved an extended BECOME event, which I have represented in (36), is indeed the crucial part of the definition of accomplishments. Although it is possible to analyse accomplishments as consisting of an activity and an achievement, representing their meaning as I did in the template in (5b) so as to make reference only to the activity and the achievement (or culmination) subevents is to miss the crucial point about how an accomplishment works.

An accomplishment consists of an activity event and an extended BECOME process, which is **incremental** in the way I shall make precise below. The culmination of an accomplishment is defined in terms of this BECOME event as **the final minimal event in the incremental process**, the event which is the final part of the BECOME event, or, in other

words, the upper bound of the BECOME event. On this account, since the culmination event is part of the BECOME event, it must share an argument with it; thus the argument of the culmination event is the argument of the BECOME event, which, as Dowty argues, is the affected object or theme. In order to make this analysis of accomplishments precise, we need to do two things: the first is to determine what are the identifying characteristics of a BECOME event, and the second is to characterise the (non-causal) relation that holds between the activity event and the incremental event which are summed together in an accomplishment.

## 7 Incremental processes and incremental relations

I suggest then that an accomplishment is analysed as consisting of an activity e, and a BECOME event which is an incremental event which 'accompanies' it; we call this accompanying event the **incremental process**, and the culmination of the accomplishment is the final minimal event in this incremental process.

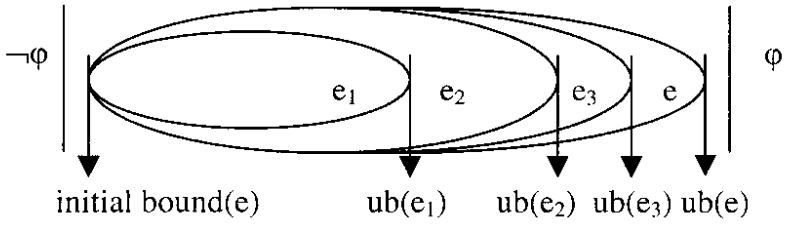
BECOME events are incremental in the sense that their parts are individuable, that each has a distinguishable upper bound, and that these parts have a natural and inherent order. This order is determined by our real-world knowledge of what the BECOME event under discussion actually entails. BECOME events are naturally conceptualised as ordered by an incremental chain as follows:

(37)**Incremental chain**
Let e be a BECOME event:
An incremental chain C(e) is a set of parts of e such that:
1. the smallest event in C(e) is the initial bound of e
2. for every $e_1$,$e_2$ in C(e) $e_1 \sqsubseteq e_2$ or $e_2 \sqsubseteq e_1$.
3. $e \in C(e)$

(38) **Culmination**
Let C(e) be an incremental chain in e.
ub(C(e)) = {ub(e'): e'∈ C(e)} (the set of upper bounds)
The **culmination** of e is defined as follows:
$cul(e)_{def} = ub(e)$

An incremental event can be represented graphically as in (39):

(39) **Incremental event (=BECOME event)**:




The function of the incremental BECOME event is to "keep track" of the progress of the activity. This requires imposing a developmental structure, or ordered part structure, on the activity (this includes assigning it a culmination), and we do this by relating it to the developmental structure of the BECOME event via an **incremental relation**:

(40)**Incremental relations:**

Let $e_1$ be an activity, $e_2$ be a BECOME event, and $C(e_2)$ be an incremental chain defined on $e_2$.

$INCR(e_1,e_2,C(e_2))$ ($e_1$ is incrementally related to $e_2$ with respect to the chain $C(e_2)$) iff:

there is a contextually available one-one function $\mu$ from $C(e_2)$ into $PART(e_1)$ (the set of parts of $e_1$ such that for every $e \in C(e_2)$: $\tau(e) = \tau(\mu(e))$.

We define the set of culminations of the parts of $e_1$ as the upper bounds of the event parts of $e_1$ which are the values of the $\mu$ function:

$$cul_{C(e2)}(e_1) = ub(\{\mu(e): e \in C(e_2)\})$$

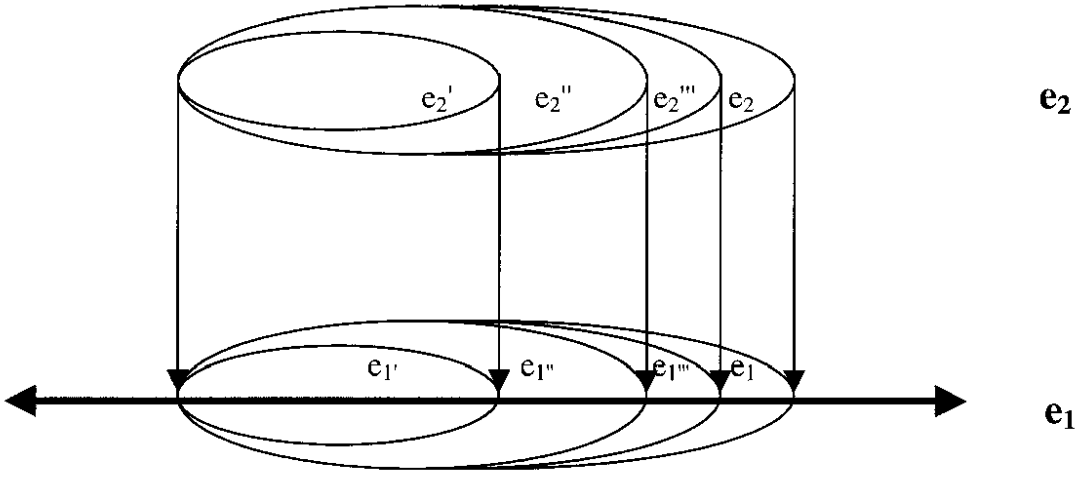
INCR is used in the meaning of accomplishments as follows (where $_{<X>}$ and $_{<Y>}$ give the content of the activity and BECOME events:

(41) **Accomplishment template**:

$\lambda y \lambda e, \exists e_1, e_2 [e = e_1 \sqcup e_2$
$\wedge$ ACTIVITY$_{<X>}(e_1) \wedge Ag(e_1) = x \wedge Th(e_1) = y$
$\wedge$ BECOME$_{<Y>}(e_2) \wedge Arg(e_2) = Th(e_1)$
$\wedge INCR(e_1, e_2, C(e_2))]$

Since the accomplishment inherits the properties of the activity, $cul(e)=cul(e_1)=cul(e_2)$.
An event structure following the template in (41) can be pictorially represented as in (42):

(42) **Accomplishment event structure**:




The intuition that this reflects is the following. Activities are inherently non-structured. They are, following Dowty, homogenous down to minimal intervals. Thus an minimal interval of an activity of walking is a minimal walking event, say taking a step, and an activity of walking is a string of minimal walking events without (relevant) breaks. This is the reason that any part of an activity event of walking which is at least as long as a minimal interval, is also an event of walking. A similar account of the activity of reading can be given, with 'minimal reading activity event' defined appropriately as, say an event of associating a perceived symbol, be it a word or a morpheme, with a meaning. Neither of these activities has an internal structure or inherent order. To give an example, if a child is practising reading

she can do it by picking out words at random from a book, and indeed, lots of children's' 'word books' are designed to allow them to practice the activity in just such an unstructured way. It doesn't matter whether the child reads the words in the book in any order or not; the minimal events of reading of which the activity consists can in principle be strung together in a number of ways, not just in the way they were in the actual event. We might well describe an event of a child engaged in such an activity as in (43a) and describe the end of such an event as in (43b), both indicating that *read* is being treated as an activity verb.

(43) a. The child read for an hour.
b. The child stopped reading.

An accomplishment event of reading is one which we identify as having an inherent order. An event described by *read the story of Snow White* does not just consist of a number of minimal reading activities; these minimal activities have to be strung together in a particular way in order for the reading activity to be an event of reading the particular story. The order of the parts of the event *read the story of Snow White* is determined by what is necessary for there to be an event which is in the denotation of the predicate $\lambda e.BECOME\ READ(e) \wedge Th(e)=$*the story of Snow White*. The words have to be read in particular order, the beginning has to be read before the middle and the middle before the end and so forth. The demands of this event are imposed on the reading activity which must perforce accompany it. The activity involved in this accomplishment is over when the event determined by the incremental process is over, i.e. when the story of Snow White is read. *The story of Snow White* is the incremental argument of the accomplishment because it is the argument of the incremental process: as the theme of the activity event and argument of the incremental process event, it is the **incremental theme**.

The incremental relation INCR uses the contextually determined one-one function $\mu$ which maps from the parts of the incremental chain $C(e_2)$ into $PART(e_1)$, the parts of the activity $e_1$. Context plays a role here in two ways. First, the incremental chain $C(e_2)$ consists of a set of events which are part of $e_2$ which are arranged in a partial order. Context plays a role in the choice of which event-parts of $e_2$ are in the chain $C(e_2)$, in other words which event parts of $e_2$ are in the domain of $\mu$. If the event is *read a book* then the relevant parts will be different depending on whether the agent is my four year old and the book is *Big Egg*, or whether I am the agent and the book is *War and Peace*. In the first place the contextually relevant parts of the incremental event determined by *Big Egg* becoming read may be the event of reading a page of the book, or even a word of it, while in the second, the contextually relevant part events of the event of *War and Peace* becoming read are likely to be much bigger: at least the events of reading a chapter. Second, the existence of a relevant $\mu$ function depends on there being some contextually available 'connection' between the incremental event and the activity which makes it plausible to impose the developmental structure of one upon the other. When the accomplishment is a lexical one such as *read*, the whole point is that the nature of the event itself guarantees a relation between the activity and a BECOME event which leaves little, if anything, for context to determine. But, the role of context in establishing a plausible incremental relation is crucial in determining the acceptability of the derived accomplishments used in resultative constructions, whose formal properties we will look at in the next section. Thus compare (44a) and (44b):

(44) a. Mary sang the baby asleep.
b.# Mary ate the baby asleep.

(44a) is easily considered acceptable by most native speakers, because the contextual relation between singing and a baby becoming asleep is easily recognised. (44b) is generally

considered infelicitous because such a contextual relation is not available. But, suppose I provide one. Suppose that Mary's child is a very bad sleeper, and Mary, who is thoroughly exhausted, has to sit with the child for hours in the middle of the night to get her to sleep. The only way Mary can manage to keep going is by sitting by the baby's bed with a large box of candies and cookies, and by eating and eating. Under such circumstances, she might say "I ate the baby asleep again tonight". And most informants then find the sentence much improved.

To sum up then, an **incremental process** is a BECOME event with an inherent internal progression expressed by the fact that it has distinguishable parts which have an inherent order, and which form an **incremental chain.** The **incremental relation** between an activity and an incremental process (with respect to an incremental chain) relates parts of the incremental process to parts of the activity, using the developmental structure of the process to assign a developmental structure, and thus a culmination, to the activity. The **incremental argument** is the argument of the incremental process. We can see then that what structures the accomplishment event is not (necessarily) the gradualness with which the parts of the theme are affected, but the fact that the process which affects the theme is a gradual process with recognisable stages ordered in a particular way is determined by the process. The process may affect the theme gradually: this is the case in particular with verbs of consumption and creation; but these are special cases of the more general incremental process.

## 8 Abstract accomplishments

With lexical accomplishments such as *build a house* and *read Snow White* the activity is obligatorily associated with an inherently related incremental process; in other words there is no choice which incremental activity is chosen to 'measure out' or developmentally structure the activity. I assume that verbs such as *wipe,* which can head VPs such as *wipe the table* which have an activity and an accomplishment reading, are lexically associated with an incremental process, but that the association is optional. However, in addition to the lexical accomplishments, where the association is lexical, the English resultative rule can also trigger a type-shifting operation which shifts activities into an accomplishment reading, and derives what I call 'abstract' or 'derived' accomplishments. These are of course the constructions which we discussed in section 5. In these cases, exemplified by *hammer the metal flat* and *sing the baby asleep,* an activity is associated with an incremental process which itself is identified by the property that its culmination has. Thus *hammer the metal flat* associates an activity of hammering the metal with an incremental process defined by the fact that its culmination is PART-OF the event of the metal being flat. Thus the string of minimal hammering-the-metal events of which the activity consists is ordered by the degree to which the metal being hammered is flat, with the upper bound of the event being the point at which the metal has the flat property. ACCOMPLISHMENT SHIFT applied to a transitive activity as in (45):

(45) **accomplishment shift (for transitive activities):**

$$\text{SHIFT}(\lambda y \lambda e.\ \text{ACTIVITY}_{<X>}(e) \wedge \text{AG}(e)=x \wedge \text{Th}(e)=y) =$$
$$\lambda y \lambda e.\exists e_1,e_2[e = e_1 \sqcup e_2 \wedge \text{ACTIVITY}_{<X>}(e_1) \wedge \text{Ag}(e_1) = x \wedge \text{Th}(e_1) = y$$
$$\wedge\ \text{BECOME}_{<Y>}(e_2) \wedge \text{Arg}(e_2) = y$$
$$\wedge\ \text{INCR}(e_1,e_2,C(e_2))$$

The interpretation for *Mary hammered the metal flat* is as in (46):

(46) Mary hammered the metal flat.

a. the short form (as in section 5 above):

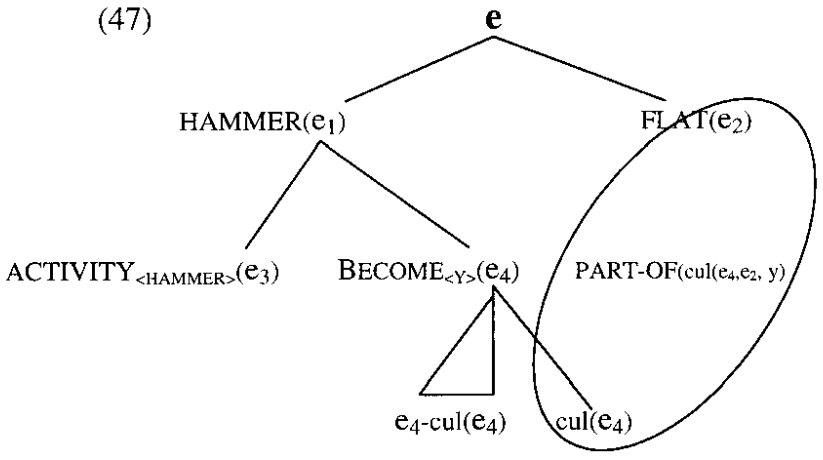
$\exists e,e_1,e_2[e = e_1 \sqcup e_2 \wedge \text{HAMMER}(e_1) \wedge \text{Ag}(e_1)=\text{MARY} \wedge \text{Th}(e_2)=\text{THE METAL}$
$\wedge \text{FLAT}(e_2) \wedge \text{Arg}(e_2)=\text{THE METAL}]$
$\wedge \text{PART-OF}(\text{cul}(e_1), e_2, \text{THE METAL})]$

"There was an event which was the sum of a hammering event with Mary as agent and the metal as theme, and an event of the metal being flat, and the culmination of the hammering event was PART-OF the event of the metal being flat."

b. the long form: $\exists e,e_1,e_2,e_3,e_4[e = e_1 \sqcup e_2 \wedge e_1 = e_3 \sqcup e_4$
$\wedge \text{ACTIVITY}_{<\text{HAMMER}>}(e_3) \wedge \text{Ag}(e_3) = \text{MARY} \wedge \text{Th}(e_3)=\text{THE METAL}$
$\wedge \text{BECOME}_{<Y>}(e_4) \wedge \text{Arg}(e_4)=\text{THE METAL}$
$\wedge \text{INCR}(e_3,e_4,C(e_4))$
$\wedge \text{FLAT}(e_2) \wedge \text{Arg}(e_2)=\text{THE METAL}$
$\wedge \text{PART-OF}(\text{cul}(e_1), e_2, \text{THE METAL})]$

The structure is given in (47):

(47)




Accomplishment shift for intransitive activities, such as is used in *sing the baby asleep*, must add an argument to the intransitive activity, as in (48):

(48) **accomplishment shift (for intransitive activities):**

$\text{SHIFT}(\lambda e.\ \text{ACTIVITY}_{<X>}(e) \wedge \text{AG}(e)=x) =$
$\lambda y \lambda e.\exists e_1,e_2[e = e_1 \sqcup e_2 \wedge \text{ACTIVITY}_{<X>}(e_1) \wedge \text{Ag}(e_1) = x$
$\wedge \text{BECOME}_{<Y>}(e_2) \wedge \text{Arg}(e_2) = y \wedge \text{Arg}(e_2)=\text{Th}(e_1)$
$\wedge \text{INCR}(e_1,e_2,C(e_2))$

The interpretation for *John sang the baby asleep* is as in (49):

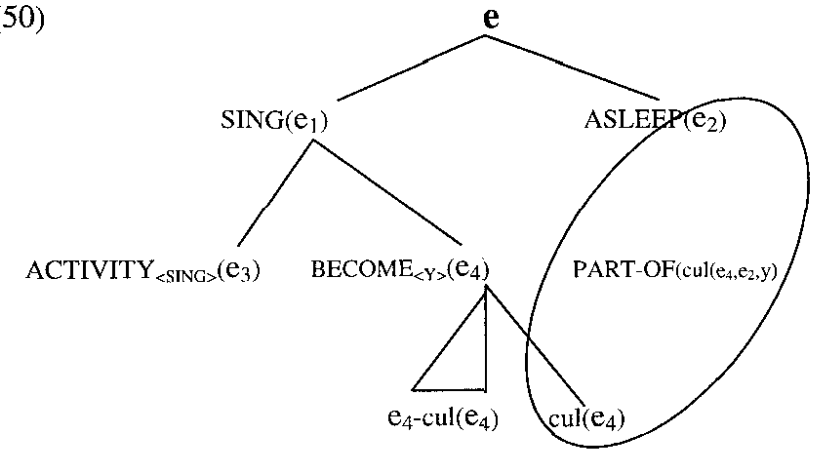
(49) John sang the baby asleep.

a. the short form:

$\exists e,e_1,e_2[e = e_1 \sqcup e_2 \wedge SING(e_1) \wedge Ag(e_1) = JOHN$
$\wedge ASLEEP(e_2) \wedge Arg(e_2) = THE\ BABY$
$\wedge PART\text{-}OF(cul(e_1), e_2,)]$

b. the long form: $\exists e,e_1,e_2, e_3,e_4[e = e_1 \sqcup e_2 \wedge e_1 = e_3 \sqcup e_4$
$\wedge ACTIVITY_{<SING>}(e_3) \wedge Ag(e_3) = JOHN$
$\wedge BECOME_{<Y>}(e_4) \wedge Arg(e_4) = THE\ BABY \wedge Arg(e_4) = Th(e_3)$
$\wedge INCR(e_3,e_4,C(e_4))$
$\wedge ASLEEP(e_2) \wedge Arg(e_2) = THE\ BABY$
$\wedge PART\text{-}OF(cul(e_1), e_2, THE\ BABY)]$

(50)




## 9 Quantization and Telicity

The account of accomplishments that I have been giving makes the claim that there is a lexical difference between simple transitive activities like *push* and transitive accomplishments like *read* or *build*; the simple activities have an interpretation of the form $\lambda e.ACTIVITY_{<X>}(e)$ while accomplishments have complex structures of the form in (41). If so, then we would expect *build* to have the same interpretation in both (51a) and (51b).

(51) a. Mary built a house in a month.
b. Mary built houses for a month.

But, as we have seen, the VP in (51a) behaves as a telic predicate and the VP in (51b) behaves as non-telic predicate. As we saw in section 3, Krifka assumes that the quantized or non-quantized status of the direct object is responsible for this. He argues that the crucial property of verbs like *build* is that the thematic relation **theme** is a homomorphism from event to the extent of the theme argument, structured in such a way that if we know the size or extent of the value of **theme**, we will know when the endpoint of the event occurs. The account I have presented here argues that telic points are not determined by the extent of objects, but by the 'natural' course of an incremental process associated with the verb. Nonetheless, the data in (51) show that the status of the direct object does directly affect the telic status of the VP, and the question is why.

The question is far to big to discuss in this paper, and I shall just sketch an outline to an answer. I assume that the defining property of being an accomplishment is being

associated with the template in (41), and that the example in (51b) as well as (51a) involves an incremental predicate. "John was building houses last week" does not entail "John built houses last week", which is a clear indication that the VP is indeed an accomplishment. However, the infelicity of (52) does indicate that the bare plural object is associated with an atelic reading:

(52) #John built houses in a month.

I suggest that what makes (52) atelic is that the plurality of the direct object means that the event is an event which must be associated with a plurality of BECOME events, whose number is unspecified. The end point of the accomplishment is determined by when the endpoint of all these BECOME events is reached, but there is no evidence as to how many of them there are nor as to whether they are running cocurrently or sequentially. The location of the endpoint is then unidentifiable. A plural like (53) is telic because we know exactly how many BECOME events there are, and thus when they are over (at least on an 'exactly three') reading.

(53) John built three houses.

Similarly (54) is telic, although its direct object is cumulative, because there need be only one BECOME event associated with the activity:

(54) John ate some sandwiches in a very few minutes, and then left.

Note further, that (55a) shows that resultatives can occur with atelic predicates. Since we have argued that resultatives can occur only with incremental events, atelic resultatives should be impossible if atelicity meant non-incrementality. But (55a) is grammatical precisely because the resultative expresses a property of the culmination of each individual BECOME event, and the atelicity of the sentence derives from the plurality. This is shown very clearly in (55b), where the individual event *wipe a table clean* is asserted to take place in less than five minutes, and is thus telic, but the plural event which is the sum of an unspecified number of these individual events is atelic:

(55) a. John wiped tables clean for three months.
b. John wiped tables clean in two minutes for three months this summer.

Clearly, this is only the beginning of a discussion of the effects of quantized and cumulative direct objects on the telic/atelic status of VPs; in particular I have not even begun to discuss the cumulative/non-quantizing effect of mass nouns in direct object position. But I hope the discussion in this section is enough to show that the theory of incrementality and accomplishments which I have been developing is compatible with, and in fact requires, an explanation of the quantizing effect of direct object nominals.

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# Nominal Predication and Focus Anchoring*

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## Abstract

It will be shown that verbs can be missing in predicative sentences by using the data from Chinese. Copula-less sentences in Chinese are subject to 'Generalized Anchoring Principle' (GAP), which requires that every clause be anchored at the interface for LF convergence. To satisfy GAP, clauses may be either tensed or focused. It is shown that copula-less sentences in Chinese are subject to focus anchoring. It will be further argued that whether a verb is needed in predication depends on the syntax of predicate nominals.

## 1 Introduction

In English, every sentence must have a verb. Basically, sentences without a verb are ungrammatical.

(1) John *(is) a genius.
(2) John *(is) very clever.

Suppose that the existence of verbs is a mandatory requirement in English. Some questions arise:

(3) a. Is such a requirement universal?
b. If it is not universal, how can verbs be omitted?
c. If omission of verbs is permitted by Universal Grammar, why do we need verbs?

I will try to answer these three questions in sections 2, 3, and 4, respectively. The focus of the discussion in this paper will be on Chinese copula-less predicative sentences.

## 2 Nonexistence of verbs

Chinese is a language that has verbs. For example, *shi* 'be' and *xihuan* 'like' are verbs in Chinese.

(4) Ta shi Deguoren.
he be German
'He is a German.'

* I wish to express my sincere gratitude to a number of people for their input and constructive comments along the way as I have pursued the research in this paper, including Horst-Dieter Gasde, Ewald Lang, Paul Law, Thomas Lee, Susan Rothstein, Dingxu Shi, Wei-Tien Tsai, Chris Wilder, Ning Zhang, as well as participants in the Workshop on Predicative Constructions held at Zentrum für Allgemeine Sprachwissenschaft (ZAS), October 16-17, 2000. Needless to say, defects are not the fault of any of them. This work is partially supported by the Hong Kong Polytechnic University Central Research Grant G-S971 and funding from ZAS.

(5) Wo xihuan dongtian.
I like winter
'I like winter.'

The claim that every sentence needs a verb can be immediately refuted by Chinese as omission of verbs is allowed in Chinese. There are two major types of 'verbless' sentences in Chinese, namely 'copula-less sentences' and 'empty verb sentences'.[1] Consider the data given below.

*Copula-less sentences*

(6) Jintian xingqiyi.
today Monday
'Today is Monday.'

(7) Zhangsan Zhongguoren.
Zhangsan Chinese
'Zhangsan is a Chinese.'

*Empty verb sentences*

(8) Wo niurou mian, Zhangsan zhurou mian.
I beef noodle Zhangsan pork noodle
'I order/eat beef noodle and Zhangsan pork noodle.'

(9) Meige ren san-ben shu.
every person three-Cl book
'Everyone has three books.'

A major difference between copula-less sentences and empty verb sentences is that the second nominal in copula-less sentences is a predicate while the second nominal in empty verb sentences is the logical object of the event. The relation between the two nominals in the copula-less sentences is 'predication': the second nominal is a predicate nominal which is predicated of the first nominal, i.e. the subject.[2]

Predicate nominals in the copula-less sentences denote the character and quality of the subject. They can be common nouns, proper names, and numerals.

(10) Zhangsan [shagua]. (common nouns)
Zhangsan fool
'Zhangsan is a fool.'

(11) Zhege haizi [da yanjing].
this kid big eye
'This kid has big eyes.'

(12) Qu nian [huang nian], jin nian [feng nian].
last year famine year this year bumper year
'Last year was a famine year and this year a bumper year.'

(13) Wo [Zhangsan]. (proper names)
I Zhangsan
'I am Zhangsan.'

[1] 'Empty verb sentences' are also known as 'eventive constructions' in Zhang (2000).

[2] Other differences between these two types of verbless sentences are: (i) unlike the copula-less sentences, the second nominal in the empty verb sentences should not be existential/indefinite (Tang 1998, Zhang 2000), and (ii) the interpretation of the relation between the two nominals in the empty verb sentences relies on discourse information (Wang 2000).

(14) Yi-bei kafei [wu kuaiqian]. (numerals)
one-Cl coffee five dollar
'A cup of coffee costs five dollars.'
(15) Ta [sanshi sui].
he thirty year
'He is thirty years ago.'

The copula *shi* 'be' can be inserted in most of the copula-less sentences. For example, both (16)(=(7)) and (17) are acceptable in Chinese.

(16) Zhangsan Zhongguoren.
Zhangsan Chinese
'Zhangsan is a Chinese.'
(17) Zhangsan shi Zhongguoren.
Zhangsan be Chinese
'Zhangsan is a Chinese.'

Notice that omission of the copula *shi* 'be' is restricted to predicative sentences. The copula *shi* 'be' cannot be omitted in specificational sentences and equative sentences.

(18) Wo mai de *(shi) zhe duo hua. (specificational)
I buy DE be this Cl flower
'What I bought is this flowers.'
[description – item]
(19) Zhe duo hua (shi) wo mai de.
this Cl flower be I buy DE
'This flower is what I bought.'
[item – description]
(20) *Acht* *(shi) ba. (equative)
eight be eight
'*Acht* is eight.'
(21) Ba *(shi) *acht*.
eight be eight
'Eight is *acht*.'

Although some sentences are regarded as predicative sentences, the copula *shi* 'be' cannot be omitted. Based on the contrast among (22)(=(10)), (23), and (24), we may assume that the copula *shi* 'be' can be omitted in predicative sentences only when the predicate nominal is not preceded by the numeral-classifier phrase.[3]

(22) Zhangsan shagua.
Zhangsan fool
'Zhangsan is a fool.'
(23) Zhangsan *(shi) yi-ge shagua.
Zhangsan be one-Cl fool
'Zhangsan is a fool.'

[3] Zhang (2000) argues that *shagua* 'fool' in (24) undergoes NP raising. Suppose that predicate nominals in Chinese copula-less sentences must be 'bare' (Tang 1998 and our discussion in section 4 of this paper). After NP raising, the predicate nominal becomes 'bare' in a sense that it is not c-commanded by the numeral-classifier phrase and thus (24) obeys the bareness requirement.

(24) Zhangsan (shi) shagua yi-ge.
Zhangsan be fool one-Cl
'Zhangsan is a fool.'

Furthermore, the omission of the copula *shi* 'be' is prohibited in the 'coda' construction, such as (25).[4]

(25) Wu-li you yi-ge ren [*(shi) shagua]. (the 'coda' construction)
house-in have one-Cl person be fool
'There is a person in the room who is a fool.'

By using the data from Chinese, I have shown in this section that copula-less predicative sentences are grammatical in Chinese. Consequently, the claim that every sentence must have a verb should not be universal.

## 3 Constraints on copula-less predicative sentences

### 3.1 Salvaging devices for making an unnatural copula-less predicative sentence natural

Although copula-less predicative sentences exist in Chinese, their use is not unconstrained. In some situation, copula-less sentences may sound unnatural. For example, (26) and (27) are 'unnatural' and 'incomplete' if they are uttered in an out-of-the-blue context. In this subsection, I will illustrate how the judgment of copula-less sentences in Chinese can be improved.

(26) ?? Zhangsan xuesheng.
Zhangsan student
'Zhangsan is a student.'
(27) ?? Ta xiaotou.
he thief
'He is a thief.'

First of all, juxtaposing a copula-less sentence with a parallel one in a contrast structure will improve the judgment. Compare (26) with (28).

(28) Zhangsan xuesheng, Lisi jiaoshou.
Zhangsan student Lisi professor
'Zhangsan is a student and Lisi a professor.'

Second, modifying the predicate nominal by an adjective may also improve the judgment, particularly when an adjective that has an 'evaluative' judgment is inserted. For example, the predicate nominal in (29a) (=(26)) is unmodified. The sentence becomes more natural once the adjective *hao* 'good' is inserted. There is a contrast between (29a) and (29b).

[4] To explain the ungrammaticality of (25), one possibility is to assume that the coda must be 'clausal' (Wilder 2000). If the bracketed element without *shi* 'be' in (25) is not a clause, it cannot be the coda. What happens if the coda without *shi* 'be' is a bare small clause, i.e. a clause without a verb? If Wilder (2000) is right, a null operator undergoes movement out of the coda. The ungrammaticality of (25) is due to extraction out of bare small clauses, which violates constraints on movement (Tang 1998).

(29) a. ?? Zhangsan xuesheng.
Zhangsan student
'Zhangsan is a student.'
b. Zhangsan hao xuesheng.
Zhangsan good student
'Zhangsan is a good student.'

Third, even if one does not add any adjective, if the meaning conveyed by the predicate nominal is 'specific' enough, we can produce sentences like (30b) and (31b) as 'natural' and 'complete' sentences. 'Specificity' here refers to a subset of a presupposed set. For example, *daxue sheng* 'university student' in (30b) is a subset of *xuesheng* 'student'. The former should be more 'specific' than the latter. In (31b), as the meaning of *Zhongguoren* 'Chinese' is more 'specific' than *ren* 'human', the judgment of (31b) is much better than (31a).

(30) a. ?? Zhangsan xuesheng.
Zhangsan student
'Zhangsan is a student.'
b. Zhangsan daxue sheng.
Zhangsan university student
'Zhangsan is a university student.'
(31) a. * Zhangsan ren.
Zhangsan human
'Zhangsan is a human being.'
b. Zhangsan Zhongguoren.
Zhangsan Chinese
'Zhangsan is a Chinese.'

Fourth, it may be more felicitous if the predicate nominal conveys the speaker's judgment and attitude rather than fact. For example, the (b) sentences convey more subjective judgment of the speaker than those (a) sentences in (32) and (33). The copula-less sentences in (32b) and (33b) describe a characterization about which an opinion or judgment can be expressed.

(32) a. ?? Zhangsan xuesheng.
Zhangsan student
'Zhangsan is a student.'
b. Zhangsan shagua.
Zhangsan fool
'Zhangsan is a fool.'
(33) a. ?? Zhangsan nanren.
Zhangsan man
'Zhangsan is a man.'
b. Zhangsan nanzihan.
Zhangsan man
'Zhangsan is a man (*more vivid*).'

Fifth, adding a focus adverb, such as *cai* 'only', may improve the sentence, as in (34). However, notice that having other kinds of adverbs, such as temporal adverbs, does not help.

For example, even though temporal adverbs *jintian* 'today' and *gang* 'just' are added in (35), the copula-less sentence still sounds 'unnatural' and 'incomplete'.

(34) Zhangsan cai zhujiao.
Zhangsan only research assistant
'Zhangsan is only a research assistant.'

(35) * Zhangsan jintian/gang zhujiao.
Zhangsan today/just research assistant
'Zhangsan is (just) a research assistant (today).'

Last but not least, I observe that embedding the copula-less sentence within a larger sentence may help complete the sentence.[5] The embedded contexts encode 'epistemic modality'. Copula-less sentences are not permitted in 'factual' contexts. See the contrast between (36) and (37).

(36) Wo dang [Zhangsan xuesheng].
I consider Zhangsan student
'I consider Zhangsan a student.'

(37) * Wo zhidao [Zhangsan xuesheng].
I know Zhangsan student
'*I know Zhangsan a student.'

Based on the above discussion, we may notice that the use of copula-less sentences is not unconstrained in Chinese. Their usage will be more natural only in some particular contexts. The contexts that may contribute to the 'naturalness' and 'completeness' of copula-less sentences in Chinese can be summarized in (38).

(38) *Contexts that contribute to naturalness of copula-less sentences in Chinese*
(a) in contrastive contexts
(b) having a modified predicate nominal
(c) having a 'specific' predicate nominal
(d) having a subjective judgment
(e) having a focus adverb
(f) embedding

Without the above contexts, copula-less sentences become 'unnatural' and 'incomplete'. If these contexts are regarded as 'salvaging devices', it seems that copula-less sentences can be 'licensed' by any one of these devices in order to be used naturally and freely. Are these contexts unrelated? Do they share any similarities? Can we further derive any generalizations from these contexts listed in (38)? I will address all these questions in the next subsection.

## 3.2 Generalized Anchoring Principle

Before discussing the properties of copula-less sentences in Chinese, let me spell out a working hypothesis in this paper. I assume that all sentences, including copula-less sentences in Chinese, are subject to a constraint that requires that every sentence in natural language be licensed at the interface levels, which is dubbed as 'Generalized Anchoring Principle' or 'GAP' (Tang and Lee 2000).

[5] The bracketed constituent in (36) is also known as a 'small clause'. See Tang (1998) for a detailed discussion on the small clause construction in Chinese.

(39) *Generalized Anchoring Principle (GAP)*
Every clause must be either tensed or focused at the LF interface level.

Why do we need GAP? Even though a derivation that derives a linguistic expression violates no principles internal to the computation system of human language $C_{HL}$, such as economy principles and cyclicity, the expression is not necessarily ready to be used. Universal Grammar has to make sure that every object generated by $C_{HL}$ is accommodated to the external systems.

Along these lines, GAP, which requires that every sentence be anchored, is imposed at the LF interface from the external systems that make use of the information provided by $C_{HL}$. In other words, GAP can be regarded as a 'bare output condition'. In this vein, the examples of copula-less sentences I have shown in the previous subsection are considered to be incomplete because they are not anchored in order to be fully interpretable at the LF interface and to be used by the external systems.

There are two strategies to satisfy GAP in natural languages: sentences are either tensed or focused in the sense that it highlights an item in contrast to a set of alternatives supplied by the context of utterance.

In the case of tense, on a par with the analysis of tense by Enç (1987), an event is anchored with respect to the moment of speech or a reference event. In the case of focus, I propose that an item is anchored with respect to a reference set of items, or an event is anchored vis-à-vis a reference set of events.

'Focus' discussed in this paper refers to the inducing of a contrasting set of individuals, properties or events by means of focusing devices associating with constituents in a sentence, a notion central to most theories of focus (cf. Konig 1991, Krifka 1992, Rooth 1992). It subsumes phenomena such as 'symmetric contrastive focus' explored in Rooth (1992), which involves two clauses or sentences, or even a single sentence in which there are two elements of the same type in focus; one contrasting with the other. Anchoring by focus provides another route to temporal anchoring, satisfying GAP.

How does GAP account for the salvaging devices for copula-less sentences in Chinese?

Contrast structures such as those in (28) make it clear that we are speaking of an arrangement of participants and situations having a 'list reading'. The copula-less sentence is juxtaposed with an alternative situation. The invoking of a contrast set is a key element underlying focus structure.

Regarding the role of the adjectives in the modified predicate nominals, they may introduce new information in certain contexts and receive a contrastive stress or contrastive accent. For example, the adjective *hao* 'good' in (29b) can be marked a new, as repeated in (40a). With intonation focus, (40a) contributes a set of propositions of the form, such as (40b) to the representation, which can be regarded as a set of alternatives to the assertion 'He is a good student' in the sense of Rooth (1992).

(40) a. Zhangsan HAO xuesheng.
Zhangsan good student
'Zhangsan is a GOOD student.'
b. Zhangsan is a *x* student.

I assume that the 'specific' predicate nominals and those predicate nominals that convey a subjective judgment of the speaker have a similar effect as what the modified predicate nominals have. They are contrasted with some presupposed properties. For example, in (30b), as repeated in (41), the speaker seems to contrast the predicate nominal with other properties: 'Zhangsan is a UNIVERSITY student (and not an ordinary student).' In (32b), as repeated in (42), the predicate nominal *shagua* 'fool' is highlighted in contrast to a set of alternatives: 'Zhangsan is a FOOL (and not a genius).'

(41) Zhangsan daxue sheng.
Zhangsan university student
'Zhangsan is a university student.'

(42) Zhangsan shagua.
Zhangsan fool
'Zhangsan is a fool.'

The observation that the predicate nominal in copula-less sentences is juxtaposed with some presupposed properties seems to be reminiscent of Ma's (1998) analysis of Chinese predicate nominals. According to him, a nominal that can be used as a predicate in Chinese should convey an 'ordinal meaning'. For example, *chuntian* 'spring', *xiatian* 'summer', *qiutian* 'fall', and *dongtian* 'winter' are in a particular sequence and their meaning is known as the 'ordinal meaning'.

Along these lines, the nominal *daxue sheng* 'university student' in (41) can be associated with other nominals, such as *xiaoxue sheng* 'elementary school student' and *zhongxue sheng* 'high school student', all of which are in a sequence and convey an 'ordinal meaning'. Hence, the acceptability of (41) is predicted under Ma's (1998) analysis.

However, as noted by Ma (1998:67), acceptable examples like (31b) and (42) are problematic in his analysis as some Chinese nominals that denote properties, such as *Zhongguoren* 'Chinese' in (31b) and *shagua* 'fool' in (42), have nothing to do with the 'ordinal meaning'. Their acceptability will be unexplained unless we propose some ad hoc definitions of ordinality (cf. Ma 1998:68 fn 9).

Without appealing to any ad hoc solutions, focus anchoring provides a unified and very natural explanation: all these contexts induce focusing effects in contrasting the situation depicted with an alternative set of situations. The copula-less sentences with modified predicate nominals and those having a 'specific' meaning and a subjective judgment are all anchored by focus, satisfying GAP.

In the case of having a focus adverb in copula-less sentences, such as *cai* 'only' in (34), the focus adverb invokes a contrast set and induces focusing effects in contrasting the situation depicted with an alternative set of situations.

If a copula-less sentence is embedded in a context that denotes epistemic modality, the matrix epistemic verb, such as *dang* 'consider' in (36), contributes to focus anchoring in that modality in embedding contrasts a possible world with the actual state of affairs.

Focus anchoring may save some apparently unacceptable copula-less sentences in Chinese. As noted by Shi (2001), it is normally unacceptable in isolation if the predicate nominal is too long, such as (43). He points out that the judgment will be improved if a 'well-defined' context is provided to force a particular reading. For example, (43) will be acceptable if it is given as the answer to a question like (44). Under the present analysis, we may say that the 'well-defined' contexts for copula-less sentences are those anchored by focus, satisfying GAP. If the long predicate nominal *Jiaodong bandao toushang yi-ge xiao yu-cun-de ren* 'a

person from a small fishing village at the tip of the Jiaodong Peninsula' in (43) is contrasted with *Liaodong bandao ren* 'people from the Liaodong Peninsula' in (44), the copula-less sentence (43) will be anchored by focus and thus it becomes acceptable.[6]

(43) (??) Wo [Jiaodong bandao toushang yi-ge xiao yu-cun-de ren].
I Jiaodong peninsula tip one-Cl small fishing-village-Mod person
'I am a person from a small fishing village at the tip of the Jiaodong Peninsula.'

(44) Women dou shi Liaodong bandao ren. Ni ne?
we all be Liaodong peninsula person you Q
'We are all from the Liaodong Peninsula. What about you?'

If the discussion in this paper is on the right track, copula-less sentences in Chinese will become 'natural' and 'complete' unless they are anchored. All the unnaturalness of the copula-less sentences is due to the violation of GAP. The so-called salvaging devices are all subsumed under focus anchoring.

(45) Copula-less sentences in Chinese should be anchored by focus.

If (45) is a correct generalization for Chinese, is it a language-particular rule? Why is it the case that copula-less predicative sentences are not easily found in English? How is the parametric variation between Chinese and English with respect to predicative sentences accounted for? All these questions will be addressed in the next section.

## 4 Syntax of copula-less sentences

Recall that in section 2 I have argued that the claim that every sentence must have a verb is not universal. For example, the copula can be omitted in predicative sentences in Chinese. If omission of the copula is possible in natural language, why can't verbs be omitted in English predicative sentences?

I propose that nominals in natural languages can be classified into two types: 'predicative' and 'non-predicative'. Predicative nominals vs. non-predicative nominals can be defined in a sense of Higginbotham's (1985) θ-binding: a predicative nominal has an open place in it, which has to be closed off by a referential category whereas the open place in a non-predicative nominal is closed off (see also Stowell 1991). In terms of syntax, all NP nominals are basically predicative. If the nominals are dominated by a functional projection, for instance Determiner Phrase DP, they are non-predicative or 'argumental' (Szabolcsi 1987, 1992, Stowell 1991a,b, Longobardi 1994). Predicative nominals and non-predicative nominals may serve as predicates and arguments, respectively.

(46) Predicative nominals: e.g. NP
Non-predicative nominals: e.g. DP

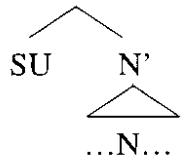
Let us assume that predicative nominals can be predicated of the subject directly without any verbal categories whereas non-predicative nominals can't. Consider the contrast between (47a) and (47b), in which 'SU' stands for the subject.[7] In (47a), N (or N') is

[6] Meanwhile copula-less sentences in Chinese are perhaps constrained by some discourse factors, in addition to focus anchoring. See Shi (2001) for a discussion along these lines.

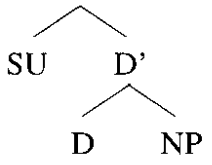
[7] (47a) should be permitted by Universal Grammar. See Stowell (1983).

predicative as it is not headed by any functional categories. On the other hand, N (or NP) in (47b) is headed by D and thus is no longer predicative. The element in the specifier of DP cannot serve as the subject for the NP. The configuration in (47b) is ungrammatical.

(47) a.




b.




Now let us consider some empirical data. In (48) *a genius* is a DP whose head is realized as the article *a* (Abney 1987). As *a genius* is not predicative, it cannot be predicated of the subject *John* directly without a verb. (48) will have a structure like (47b) and should be ungrammatical.

(48) * John a genius.

In order to make predication possible in (48), a verbal category is needed in the structure. However, bare verbs are prohibited in English, as illustrated in (49). Whenever there is a verb in English, it must be associated with some tense morphology. The contrast between (49) and (50) shows that the copula in English predicative sentences is inflected to indicate tense. Along these lines, verbs cannot be missing in English as they are required to support the inflectional suffixes. I assume that the copula *be* in English is used to bear tense features; its existence is required by tense.

(49) * John be a genius.
(50) John is/was a genius.

Even if we suppose that there is a 'null verb' in English, its existence is ruled out as it cannot support the inflectional tense morphemes. For example, the inflectional morphemes are supposed to be attached to a 'null verb' in (51). (51) is ruled out by the morphology of English that suffixes cannot be attached to null elements.

(51) * John -s/-ed a genius.

In any event, (48) is ungrammatical in English regardless of whether a contrast set is invoked to anchor (48), such as (52). If (48) is already ruled out by syntax, focus anchoring does not help.

(52) * John a genius, and Bill an idiot.

The situation in Chinese copula-less sentences is different. The predicate nominal *shagua* 'fool' in (53)(=(42)) is a bare noun. As it is a bare noun, it can be predicated of the subject *Zhangsan* directly, having a structure similar to (47a).[8]

[8] Shi (2000) argues that the first nominal in copula-less sentences should be a 'subject' rather than a 'topic'.

(53) Zhangsan shagua.
Zhangsan fool
'Zhangsan is a fool.'

The discussion here has a very interesting implication: the existence of copula-less predicative sentences is associated with the syntax of the predicate nominal. If the predicate nominal is 'bare' in English, it is predicated that it may enter copula-less sentences. I notice that in some contexts, verbs can be missing in predicative sentences in English and the prediction is borne out. Consider the following examples.

(54) You idiot!
(55) You Martha, me professor.
(56) Next station Jordan.

Expressions like (54) are known as '*you idiot* expressions', which are mainly used in exclamations involving a strong value judgment and an opinion (Tang 1998). Unless being a student is associated with some bad quality and having a negative status, (57) may not sound natural. The contrast between (54) and (57) suggests that only the nominals that have an 'evaluative meaning' may felicitously enter the *you idiot* expressions.

(57) # You student!

(55) is recorded from a conversation in a movie. What the speaker of (55) wanted to convey was to emphasize the contrast of the identity between the hearer and himself.

(56) is from the broadcast in Mass Transit Railway in Hong Kong. Similar expressions can also be found in German. For example, (58) is from the broadcast in S-Bahn in Berlin. Interestingly, the copula is always missing in such expressions.

(58) Nächste Bahnhof Friedrichstraße.
next station Friedrichstraße

In (54) and (55), as the predicate nominals *idiot* and *professor* do not have any determiner and article, they are regarded as 'bare' and are not dominated by DP. Bare NPs are predicative and they can be predicated of the subject directly. On the other hand, if there is a determiner, such as (59), the judgment is deviant. The ungrammaticality of (59) is obvious: the predicate nominal *an idiot* is a non-predicative DP by virtue of the existence of the article and thus it cannot be predicated of the subject directly.

(59) * You an idiot!

Although *Martha* in (55) and *Jordan* in (56) are proper names, they are used as indefinite common nouns in those two sentences. Such an indefinite usage of proper names is not impossible in natural languages. For example, plural markers can be attached to proper names, expressing an indefinite meaning in English (=(60)) as well as in Chinese (=(61)). I assume that definite proper names are in the D position (Abney 1987) while indefinite proper names are Ns (Longobardi 1994, Li 1999).

(60) I saw three **John**s this morning.

(61) **Zhangsan**-men shenme shihou lai?
Zhangsan-Pl what time come
'When are Zhangsans (or Zhangsan and the others) coming?'

How are the copula-less sentences in (54)-(56) in common? (54) has a strong evaluative context. Although such a strong evaluative meaning is not involved in the locative expressions, the predicate nominal, such as *Jordan* in (56), is contrasted with some presupposed stations. The hearer is expected to be aware that *Jordan* is one of the stations along the railroad. Similar to some copula-less sentences in Chinese (e.g. (28)), (55) is a contrast structure and thus it is licensed by focus anchoring. In other words, all these copula-less sentences in English are anchored by focus, satisfying GAP. It seems that the generalization stated in (45) can also hold in English.

Data from Chinese and English show that copula-less predicative sentences are anchored by focus only. Why is it the case that these sentences are anchored by focus instead of tense?

I propose that the choice of GAP is determined by syntax. Suppose that there must be a tense operator in temporal anchoring. Enç (1987) argues that tense is indexical like all other referential expressions and is conceived of as a pronominal variable, in that the truth of a tensed sentence is relative to the speech time.[9] A tense is anchored through its complementizer C (or a tense operator embedded in CP).

As copula-less predicative sentences are bare, there is no CP in the structure and thus the tense operator cannot occur. Temporal anchoring is never available in copula-less sentences.[10] If the discussion here is on the right track, the generalization stated in (45) that copula-less sentences in Chinese is only anchored by focus can be derived from the syntax of copula-less predicative sentences.

The bareness property of copula-less predicative sentences can be extended to English. The accusative Case of the subject *me* in (55) may support the present analysis that copula-less predicative sentences are bare. Let us assume with Schütze (1997) that the 'default' Case of the English subject is the accusative Case when it cannot get the nominative Case. If the copula-less predicative sentences in (55) are bare, the subject cannot receive the nominative Case from a functional category, for instance, T. Hence, the subject gets the default accusative Case. Focus anchoring in English copula-less predicative sentences follows the bareness of the structure in syntax.

## 5 Conclusion

In the literature, it is claimed that every sentence must have a verb in English. In the beginning of this paper, three questions regarding this claim were raised, as repeated in (62).

(62) a. Is such a requirement universal?
b. If it is not universal, how can verbs be omitted?
c. If omission of verbs is permitted by Universal Grammar, why do we need verbs?

[9] See also Partee (1973), Guéron and Hoekstra (1995), and Stowell (1996) for similar ideas.
[10] If we need a focus operator in focus anchoring, on a par with temporal anchoring, it could be the case that the focus operator can be adjoined to bare projections freely, regardless of whether there is CP.

Regarding the first question, the answer is 'no'. I have shown that verbs can be missing in some Chinese sentences. Copula-less predicative sentences are possible in Chinese.

If the existence of verbs is not obligatory in some sentences, how can verbs be omitted? By using the data from Chinese, I have shown that copula-less predicative sentences are acceptable when they are (i) in contrastive contexts, (ii) having a modified predicate nominal, (iii) having a 'specific' predicate nominal, (iv) having a subjective judgment, (v) having a focus adverb, and (vi) embedded.

Regarding (62c), if omission of verbs is permitted by Universal Grammar, we may wonder why English needs a copula in predicative sentences in the first place. I proposed that the existence of copula-less predicative sentences is associated with the syntactic status of predicate nominals. Bare NP nominals are predicative whereas DP nominals are non-predicative. Ungrammaticality of copula-less sentences in English is due to the morphology of tense as well as the usage of non-predicative predicate nominals. It is argued that if the predicate nominal is bare, the copula can be omitted. Supporting evidence comes from Chinese copula-less sentences, *you idiot* expressions, and locative expression in English. I have also argued that the unavailability of temporal anchoring in copula-less sentences is due to syntax.

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# On Object Specificity*

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## 1 Introduction

In general, object shift occurs in Chinese only when contrastive focusing is involved. In indicative sentences, numeral NPs survive object shift only when they are specific or definite. This is shown by the contrast between (1a) and (1b,c):[1]

(1) a. *wo **liang-ben shu** nian-guo, **san-ben shu** mei nian-guo.
I two-Cl book read-Exp three-Cl book have-not read-Exp
'I read two books, not three.'

b. wo **you liang-ben shu** nian-guo, **you san-ben shu** mei nian-guo.
I have two-Cl book read-Exp have three-Cl book have-not read-Exp
'I read two of the books, but not the other three.' (specific)

c. wo **zhe liang-ben shu** nian-guo, **na san-ben shu** mei nian-guo.
I this two-Cl book read-Exp that three-Cl book have-not read-Exp
'I read these two books, but not those three.' (definite)

Here the numeral object NP *liang-ben shu* 'two books' is in a preverbal position, and it must be bound either by the existential modal *you* 'have', as in (1b), or by a demonstrative like *zhe* 'this', as in (1c). Otherwise the sentence is simply out, as in (1a).[2]

However, this requirement is not observed when a modal is present. This point can be seen by comparing (2a,b) with (1a):

(2) a. wo **liang-ben shu** nian-de-wan, **san-ben shu** jiu bu xing le.
I two-Cl book read-can-finish three-Cl book then not possible Inc
'I can finish two books, not three.' (nonspecific)

* I would like to express my gratitude to Lisa Cheng, Gasde Horst-Dieter, Paul Law, Thomas Lee, Sze-wing Tang for sharing their thoughts with me. I am also in great debt to Niina Zhang and Chris Wilder, without whose friendship and encouragement I wouldn't have enough drive to finish this paper.

[1] The abbreviations used in this paper are glossed as follows: Cl: classifier; Exp: experiential aspect; Inc: inchoative aspect; Prf: perfective aspect; Prg: progressive aspect; Top: topic marker.

[2] The idea that object shift induces specificity is certainly not new. See Mahajan (1990), Enç (1991), Diesing (1992) for discussions on the syntax and semantics of specific NPs in various languages.

b. wo **liang-ben shu** keyi nian-wan, **san-ben shu** jiu bu xing le.
I two-Cl book can read-finish three-Cl book then not possible Inc
'I can finish two books, not three.' (nonspecific)

Here the numeral object NP *liang-ben shu* 'two books' is again in a preverbal position. The difference lies in the fact that the presence of an infixal modal *-de-* in (2a) and the presence of a modal verb *keyi* 'can' in (2b) license the otherwise ungrammatical sentence.

This indicative-modal asymmetry is reminiscent of a similar contrast of Chinese numeral NPs in subject positions, which has been under close examination in the literature (see, for instance, Lee 1986, Li 1996, Tsai 2001, among many others). As shown by the contrast between (3a) and (3b,c), nonspecific indefinites are not allowed in the subject position of an indicative sentence.

(3) a.* **liu-ge ren** tai-qi-le na-kuai shitou.
six-Cl person lift-up-Prf that-Cl rock
'Six persons have lifted that rock.' (nonspecific)

b. **you liu-ge ren** tai-qi-le na-kuai shitou.
have six-Cl person lift-up-Prf that-Cl rock
'There are six persons who have lifted that rock.' (specific)

c. **na liu-ge ren** tai-qi-le na-kuai shitou.
that six-Cl person lift-up-Prf that-Cl rock
'Those six persons have lifted that rock.' (definite)

While subject NPs are ruled out when they are nonspecific, as in (3a), similar construals are licensed either with the existential modal *you*, as in (3b), or with the demonstrative *zhe*, as in (3c). By contrast, nonspecific NPs are quite comfortable serving as the subject of a modal construction, as evidenced by (4a) and (4b):

(4) a. **liu-ge ren** tai-de-qi na-kuai shitou.
six-Cl person lift-can-up that-Cl rock
'Six persons can lift that rock.' (nonspecific)

b. **liu-ge ren** keyi tai-qi na-kuai shitou.
six-Clperson can lift-up that-Cl rock
'Six persons can lift that rock.' (nonspecific)

Nonetheless, when it comes to bare NPs in Chinese, the situation gets a bit murky: The interpretations of fronted object NPs seems sensitive to the choice of tense. As shown by (5a,b), bare NPs can be either definite or nonspecific under realis tense in postverbal object positions:

(5) women zuotian chi-le **zhurou**, qiantian chi-le **niurou**.
we yesterday eat-Prf pork day-before-yesterday eat-Prf beef
a. '(As for the meat in the refrigerator,) we have eaten the pork yesterday, and the beef the day before yesterday.' (definite)
b. '(As for dinner,) yesterday we have eaten pork, not beef.' (nonspecific)

There are therefore two ways to interpret (5): If the conversation has to do with the meat in the refrigerator, for example, then the reading is definite, as in (5a). If it is about the dinner, the reading is nonspecific, as in (5b). Once object shift applies, only the definite reading is available, as indicated by the contrast between (6a,b):

(6) women zuotian **zhurou** chi-le, **niurou** mei chi.
we yesterday pork eat-Prf beef have-not eat
a. '(As for the meat in the refrigerator,) yesterday we have eaten the pork, not the beef.' (definite)
b.# '(As for dinner,) yesterday we have eaten pork, not beef.' (nonspecific)

By contrast, sentences with irrealis tense behave quite differently: While bare NPs can be either definite or nonspecific in postverbal object positions, as in (7a,b), both the definite and nonspecific readings survive object shift, as indicated by the ambiguity of (8a,b):

(7) women mingtian chi **zhurou**, houtian chi **niurou**.
we tomorrow eat pork day-after-tomorrow eat beef
a. '(As for the meat in the refrigerator,) we will eat the pork for tomorrow, and the beef for the day after tomorrow.' (definite)
b. '(As for dinner,) we will eat pork for tomorrow, and beef for the day after tomorrow.' (nonspecific)

(8) women mingtian **zhurou** chi, **niurou** bu chi.
we tomorrow pork eat beef not eat
a. '(As for the meat in the refrigerator,) tomorrow we will eat the pork, but not the beef.' (definite)
b. '(As for dinner,) tomorrow we will eat pork, but not beef.' (nonspecific)

Moreover, when we shift the bare object NP further across temporal adverbials such as *zuotian* 'yesterday' and *mingtian* 'tomorrow', the only possible reading in both cases is definite, as evidenced by (9) and (10) respectively:

(9) women **zhurou** zuotian chi-le, **niurou** qiantian chi-le.
we pork yesterday eat-Prf beef day-before-yesterday eat-Prf
a. '(As for the meat in the refrigerator,) we have eaten the pork yesterday, and the beef for the day before yesterday.' (definite)
b.# '(As for the dinner,) we have eaten pork yesterday, and beef the day before yesterday.' (nonspecific)

(10) women **zhurou** mingtian chi, **niurou** houtian chi.
we pork tomorrow eat beef day-after-tomorrow eat
a. '(As for the meat in the refrigerator,) we will eat the pork for tomorrow, and the beef for the day after tomorrow.' (definite)
b.# '(As for the dinner,) we will eat pork for tomorrow, and beef for the day after tomorrow.' (nonspecific)

In other words, the distinction between realis tense and irrealis tense is neutralized when the object NP in question is raised over temporal adverbials.

The distributive-interpretive pattern of Chinese object specificity can then be summarized in the following table:

Table 1.

| | | pre-adverbial | in-between | post-verbal |
|---|---|---|---|---|
| realis | definite | yes | yes | yes |
| | nonspecific | no | no | yes |
| irrealis | definite | yes | yes | yes |
| | nonspecific | no | yes | yes |

As shown above, the definite reading is always there as an option, whereas the non-specific reading is on and off depending on the choice of tense, and on the syntactic position where a given object NP occurs.

In this paper, we would like to explore the possibility of deriving the subject and object specificity in a principled and unified way, mainly through the so-called Extended Mapping Hypothesis developed in Tsai (1999, 2001). Section 1 and 2 give an overview of how the issues with subject specificity can be approached from a vantage point of the syntax-semantics interface. In section 3, we proceed to show that subject specificity and object specificity are basically the same phenomena, except for a few twists on their licensing conditions. Section 4, on the other hand, provides a brief review on the interpretations of bare NPs in Chinese. Finally, in section 5, it is argued that the realis-irrealis distinction based on the interpretation of object indefinites follows from a more general dichotomy between indicative and modal constructions.

## 2 A Dynamic View of Syntax-Semantics Mapping

Let's first consider the following two questions: Is there a unified solution to the subject and object specificity? Can we provide a principled account of the asymmetry between the indicative and modal constructions? Diesing (1992) has provided an explicit answer to the former, based on the well-known tree-splitting mechanism (11):

(11) *Mapping Hypothesis*:

a. Material from VP is mapped into the nuclear scope.

b. Material from IP (excluding VP) is mapped into a restrictive clause.

The mapping mechanism maps a GB-theoretical representation to a tripartite quantificational structure, including a quantifier, its restrictive clause, and the nuclear scope (Kamp 1981 and Heim 1982). In addition, it is claimed that existential closure applies to VP, rather than to IP or Text as originally proposed by Heim. It is instructive to note that the above mechanism doesn't seem to have a global character, since existential closure is in general clause-bound. Consequently, we need to define the domain of existential closure locally, and implement mapping step by step, as stated in (12), a more "dynamic" version of the Mapping Hypothesis (Tsai 1999, 2001):

(12) *Extended Mapping Hypothesis (EMH)*:

a. Mapping applies cyclically, and vacuous quantification is checked derivationally.

b. Material from a syntactic predicate is mapped into the nuclear scope of a mapping cycle.

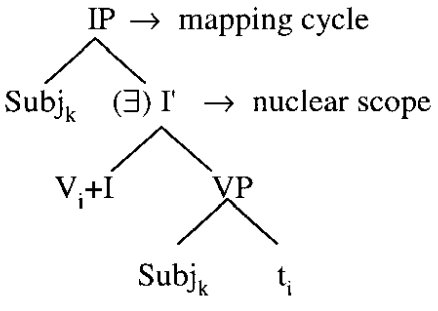
c. Material from XP immediately dominating the subject chain of a syntactic predicate (excluding that predicate) is mapped outside the nuclear scope of a mapping cycle. A subject chain is an A-chain with its tail in a subject position.

d. Existential closure applies to the nuclear scope of a mapping cycle.

Under this approach, the focus of inquiry is shifted to how to define a local domain of syntax-semantics mapping, i.e., a "mapping cycle".

On the other hand, the Mapping Hypothesis doesn't have much to say about the indicative-modal asymmetry illustrated above. To provide a feasible answer, we would like to establish a typological correlation between the absence of nonspecific subjects and the absence of V-to-I movement. Namely, in a V-to-I language like English, the domain of a primary predicate, as well as the corresponding nuclear scope, is extended from V' to I' in LF, as dictated by (12b,c). Given the VP-internal subject hypothesis, a subject chain typically has its head above the nuclear scope, while submerging its tail under the nuclear scope, as shown in the diagram (13):

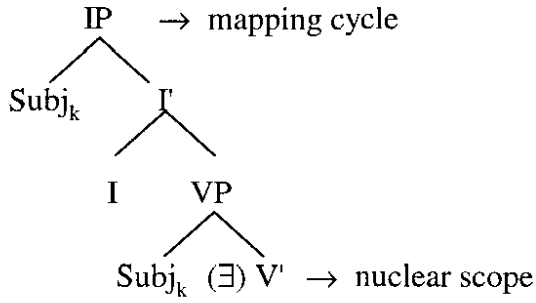
(13) English type



This move leads us to examine the issue further from the vantage point of Chomsky's (1995) Copy Theory: If the lower copy in Spec-VP is deleted, the upper copy in Spec-IP must get strongly quantified, either by its own determiner or by a sentential operator like an adverb of quantification. This is because existential closure is not available at this altitude. If the upper copy is deleted, then the lower copy is licensed by existential closure introduced according to (12d).

By contrast, Chinese-type languages lack agreement morphology, and do not license V-to-I raising. As a result, a subject chain is typically outside nuclear scope, and cannot be saved by existential closure on V', the *de facto* syntactic predicate, as illustrated by (14):

(14) Chinese type




This move provides a straightforward account of the contrast between (15a) and (15b,c) ( (3a-c) repeated here):

(15) a.* **liu-ge ren** tai-qi-le na-kuai shitou.
six-Cl person lift-up-Prf that-Cl rock
'Six persons have lifted that rock.' (nonspecific)

b. **you liu-ge ren** tai-qi-le na-kuai shitou.
have six-Cl person lift-up-Prf that-Cl rock
'There are six persons who have lifted that rock.' (specific)

c. **na liu-ge ren** tai-qi-le na-kuai shitou.
that six-Cl person lift-up-Prf that-Cl rock
'Those six persons have lifted that rock.' (definite)

In (15a), the subject chain is outside the nuclear scope, and the numeral *liu* 'six' cannot serve as a strong determiner in Milsark's (1974) sense. (15a) is therefore ruled out due to vacuous quantification. By contrast, the subject indefinites of (15b,c) are licensed by the existential modal *you* 'have' and the demonstrative *na* 'that' respectively.

## 3 Mapping Geometry of Subject Indefinites

Interestingly enough, we often observe the English type behavior in Chinese modal constructions, where it is not unusual to find overt verb raising from V to Mod, as shown in

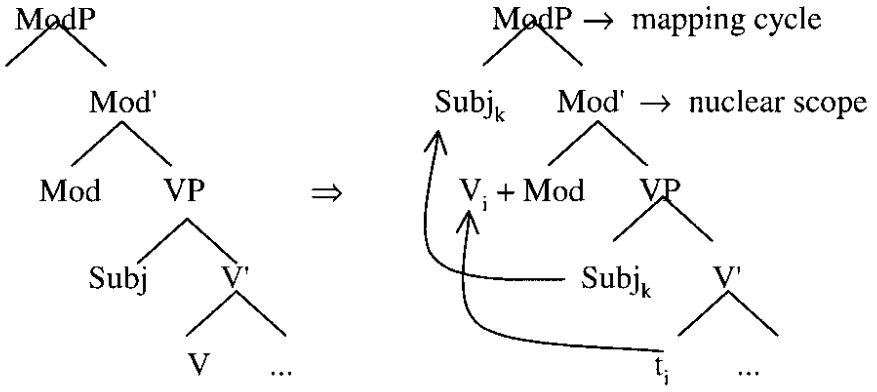
(16a) ((4a) repeated here):

(16) a. **liu-ge ren** tai-de-qi na-kuai shitou.
six-Cl person lift-can-up that-Cl rock
'Six persons can lift that rock.' (nonspecific)

b. **liu-ge ren** keyi tai-qi na-kuai shitou.
six-Clperson can lift-up that-Cl rock
'Six persons can lift that rock.' (nonspecific)

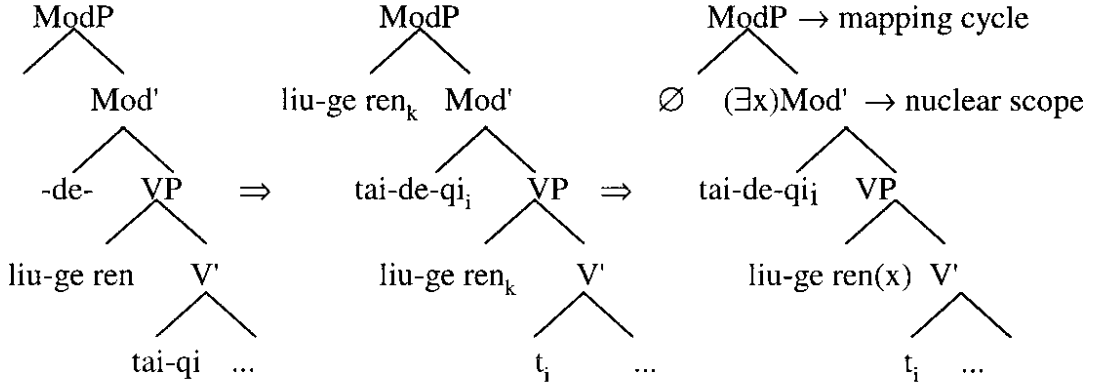
In (16a), the compound *tai-qi* 'lift-up' raises to the infixal modal *-de-* 'can', creating a mapping geometry very similar to the one in the English type configuration (13), as sketched in the following diagram:

(17)




Therefore, we would like to entertain the hypothesis that the mapping geometry of Chinese modal sentences is isomorphic to that of English indicatives, to the extent that verb raising is limited to a light or modal verb, rather than to a higher functional category such as T or Agr.[3] As a result, the subject indefinite of (16a) can be licensed by existential closure when the upper copy of the subject chain undergoes LF deletion, as illustrated below:

(18)

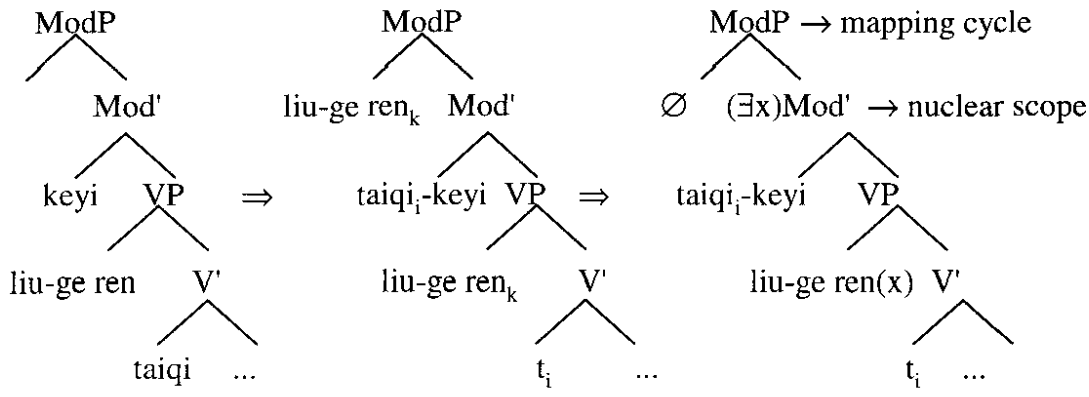



This move accounts for the nonspecific reading of (16a). The same analysis carries over to (16b) except that V-to-Mod raising applies in LF rather than in overt syntax, as shown by the

[3] In contrast to V-to-I raising, raising to a light verb or a modal verb is quite common in Chinese. For detailed discussion, see Huang (1994, 1997) and Lin (2000).

derivation of (19):

(19)




In other words, the indefinite subject gets its nonspecific reading through existential closure on Mod', given the EMH (12a-d).

## 4 Mapping Geometry of Object Indefinites

For all we have said about the subject specificity, one may well wonder whether the same story can be told about the indicative-modal asymmetry between (1a) and (2a,b) (repeated here as (20a) and (20b,c) respectively):

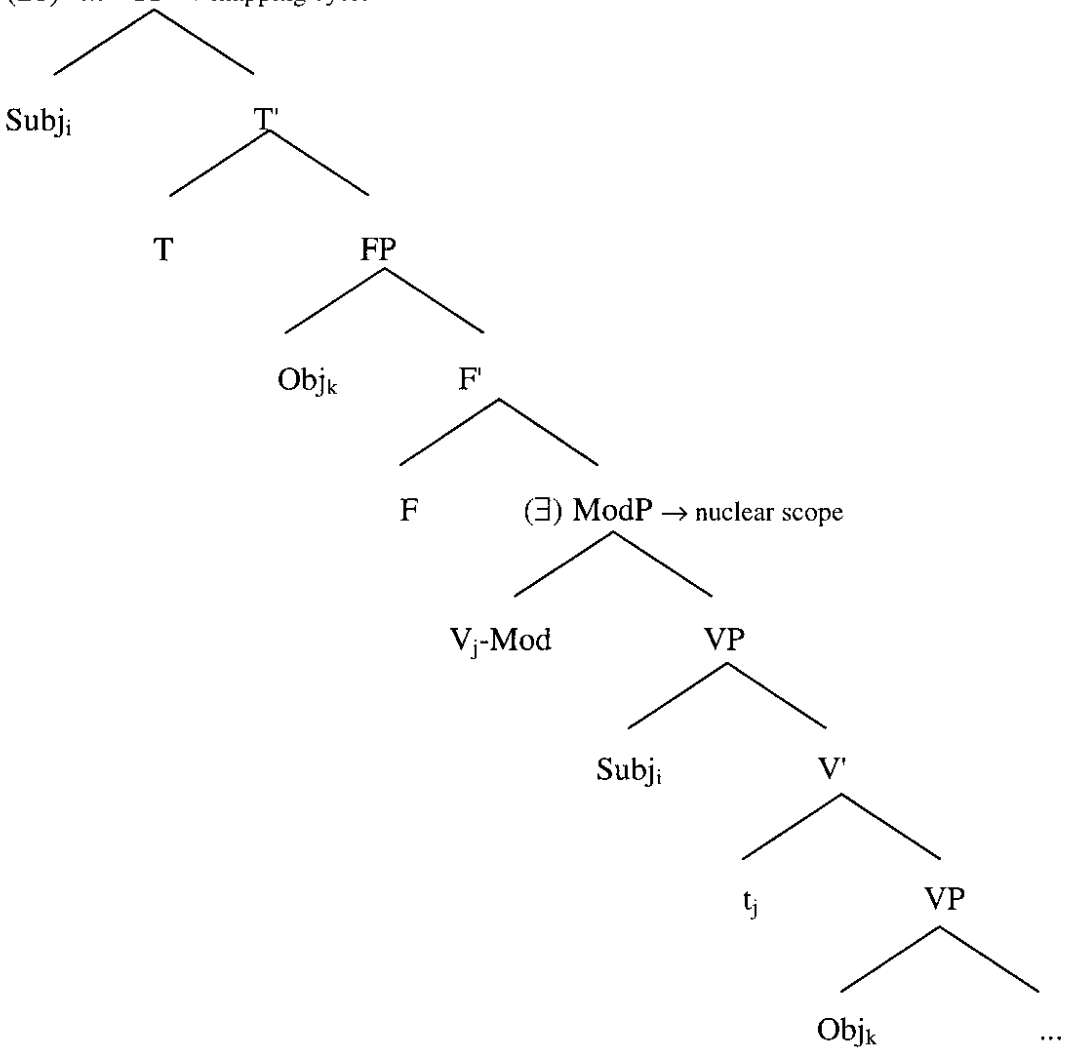
(20) a. *wo **liang-ben shu** nian-guo, **san-ben shu** mei nian-guo.
I two-Cl book read-Exp three-Cl book have-not read-Exp
'I read two books, not three.'

b. wo **liang-ben shu** nian-de-wan, **san-ben shu** jiu bu xing le.
I two-Cl book read-can-finish three-Cl book then not possible Inc
'I can finish two books, not three.' (nonspecific)

c. wo **liang-ben shu** keyi nian-wan, **san-ben shu** jiu bu xing le.
I two-Cl book can read-finish three-Cl book then not possible Inc
'I can finish two books, not three.' (nonspecific)

First consider the following mapping geometry of (20b,c) after object shift occurs:

(21) ... TP → mapping cycle




Here both the subject chain and the object chain have their tails submerged under the nuclear scope, and thus subject to existential closure. Since the verb has been raised to Mod (overtly in (20b) and covertly in (20c)), the predicate domain has been extended to ModP, which in turn forms the nuclear scope. Now if the lower object copy undergoes LF deletion, the upper copy in Spec-FP must get extra licensing since it is outside the nuclear scope. However, this is impossible because Chinese numerals cannot serve as a strong determiner. Alternatively, if it is the upper object copy that is deleted in LF, the lower copy is then subject to existential closure. Hence the nonspecific reading of (20b,c).

It follows from our treatment that both the subject and object indefinites can be nonspecific in the modal construction. This is indeed the case, as evidenced by (22a,b):

(22) a. **san-ge ren** **liu-wan fan** chi-de-wan, **jiu-wan fan** jiu bu xing le.
three-Cl person-Cl six-Cl rice eat-can-finish nine-Cl book then not possible Inc
'Three persons can finish six bowls of rice, not nine.' (nonspecific)

b. **san-ge ren** **liu-wan fan** keyi chi-wan, **jiu-wan fan** jiu bu xing le.
three-Cl person-Cl six-Cl rice can eat-finish nine-Cl book then not possible Inc
'Three persons can finish six bowls of rice, not nine.' (nonspecific)

Note that there are altogether four possibilities of interpreting (22a,b) given the Copy Theory, as illustrated below:

(23) a. $Subj_i$ ... $Obj_k$ ... [$_{nuclear\ scope}$ ... ∅ ... ∅ ... ]
b. $Subj_i$ ... ∅ ... [$_{nuclear\ scope}$ ... ∅ ... $Obj_k$ ... ]
c. ∅ ... $Obj_k$ ... [$_{nuclear\ scope}$ ... $Subj_i$ ... ∅ ... ]
d. ∅ ... ∅ ... [$_{nuclear\ scope}$ ... $Subj_i$ ... $Obj_k$ ... ]

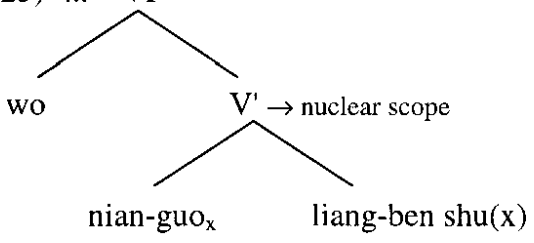
In (23a), both the lower subject and object copies are deleted, leaving the upper copies outside the nuclear scope, and hence outside of the domain of existential closure. Since there is no sentential operator around either, we should dismiss this possibility in view of vacuous quantification. (23b) and (23c) are ruled out for exactly the same reason except that there is only one offending indefinite in each case, i.e., the upper subject copy in the former and the upper object copy in the latter. Consequently, the only possible interpretation turns out to be (23d), where both the upper copies are deleted, and the lower copies are licensed under existential closure on the nuclear scope. The dual nonspecific readings of (22a,b) thus follows quite naturally from our account.

By contrast, the case with (20a) is more problematic: As shown by (24), when an object stays in situ in an indicative sentence, the reading is unambiguously specific:

(24) wo nian-guo liang-ben shu.
I read-Exp two-Cl book
'I read two books.' (specific)

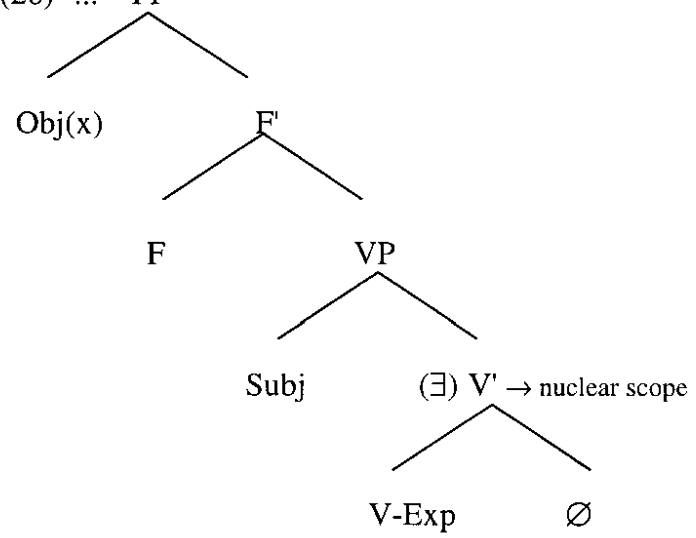
Here the crucial factor lies in the aspectual licensing from *-guo*, an experiential aspect in Li & Thompson's (1981) terms. The dependency can then be formalized as an instance of unselective binding between the aspectual operator and the variable introduced by the numeral NP, as visualized in the following diagram:

(25) ... VP



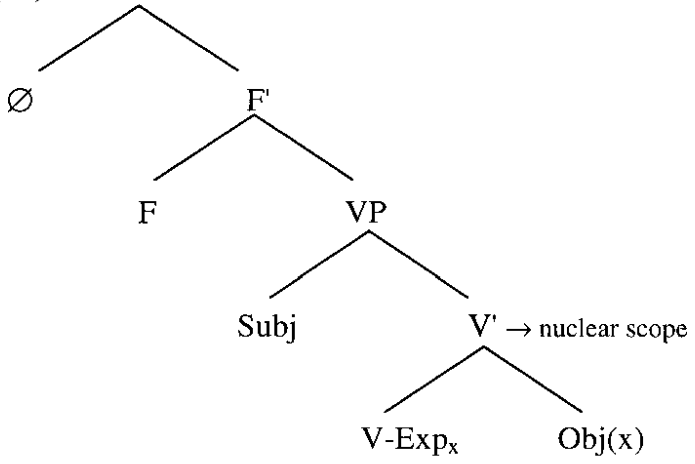

This observation raises the issue as to why (20a) cannot be saved in the way described in (25), i.e., by assigning a specific reading to the object indefinite: When the lower object copy is deleted, the upper copy is outside the nuclear scope (hence outside the domain of existential closure), resulting in vacuous quantification, as in (26):

(26) ... FP




When the upper object copy is deleted, the lower copy is subject to the licensing from the experiential aspect, as in (27):

(27) ... FP




This seems to be a natural consequence from what we have seen in (25), which, nonetheless, is not borne out.

One way to approach the problem is to say that aspectual licensing, in contrast with existential closure, only licenses a trivial chain (that is, a chain with only one member). Alternatively, it may well be the case that aspectual licensing, in contrast with existential closure, applies to a chain rather than a member of the chain: In other words, the whole chain has to be under the scope of the aspectual operator to get a specific reading. We will leave the choice open here, while concentrating on finding a feasible solution to the indicative-modal asymmetry in general.

## 5 Interpreting Chinese Bare NPs

Before we go any further, it is worthwhile to take a closer look at the semantic properties of Chinese bare NPs. Basically, if we discount generic and habitual construals, a Chinese bare NP can be either definite or non-specific, as shown by the contrast between (28a,b):

(28) wo zaoshang zongsuan zhao-dao ren le.
I morning finally search-reach person Inc
a. '(I could not find John to help me yesterday.) I finally found him this morning.' (definite)
b. '(I could not find anyone to help me yesterday.) I finally found somebody this morning.' (nongeneric and nonspecific)

In (28a) the bare NP *ren* 'person' refers to the salient individual in the discourse, and can be paraphrased as a pronoun. In (28b), there is no reference to a particular individual, and the reading is quite like *somebody* in English.[4] Although the definite construal of (28a) is anaphoric in nature, bare NPs can be deictic sometimes, as evidenced by (29a,b):

(29) ren lai le!
person come Inc
a. 'That person/He/She is coming!'
b. 'Those people/They are coming!'

By contrast, as Huang (1987) points out, Chinese bare NPs can never be specific. This point can be illustrated by comparing (30) with (31):

(30) * wo zongsuan zhao-dao-le $ren_k$ [$Op_k$ [ $t_k$ hen nenggang]].
I finally search-reach-Prf person very capable
'?? I have finally found somebody, who is very capable.

(31) wo zongsuan zhao-dao-le yi-ge $ren_k$ [$Op_k$ [ $t_k$ hen nenggang]].
I finally search-reach-Prf one-CL person very capable
'I have finally found a certain person, who is very capable.'

In (30), the bare object NP *ren* 'person' cannot take a secondary predicate. By contrast, the numeral object NP of (31) is capable of serving as the subject of secondary predication. According to our analysis, the subject of the local mapping cycle is outside the nuclear scope which corresponds to the open sentence headed by *hen nenggang* 'very capable'. If it is indeed the case that a bare NP cannot be specific, then we can rule out (30) without further stipulation.

A numeral NP, on the other hand, differs from its bare counterpart in being subject to aspectual licensing: For instance, the object indefinite of (31) is in fact unselectively bound by the perfective aspect *-le*, which asserts the existence of the people-finding event. To see this, (31) should be further contrasted with (32), where the aspect has been changed into progressive:

(32) * wo zai-zhao yi-ge $ren_k$ [$Op_k$ [ $t_k$ hen nenggang].
I Prg-find one-CL person very capable
'?? I am looking for somebody, who is very capable.'

[4] See Cheng & Sybesma (1999) for a comprehensive discussion on the distinction between bare and numeral NPs across Chinese dialects.

Here the progressive aspect does not trigger existential quantification, and secondary predication fails because the subject of the local mapping cycle (defined by secondary predication) cannot get extra licensing.

## 6 Realis Tense vs. Irrealis Tense: Indicative-modal Asymmetry Revisited

Keeping the above discussion in mind, it's time to explore the distribution and interpretation of bare NPs in presence of object shift. First consider (8) (repeated here as (33)), where the object is fronted in-between the temporal adverbial *mingtian* 'tomorrow' and the main verb *chi* 'eat':

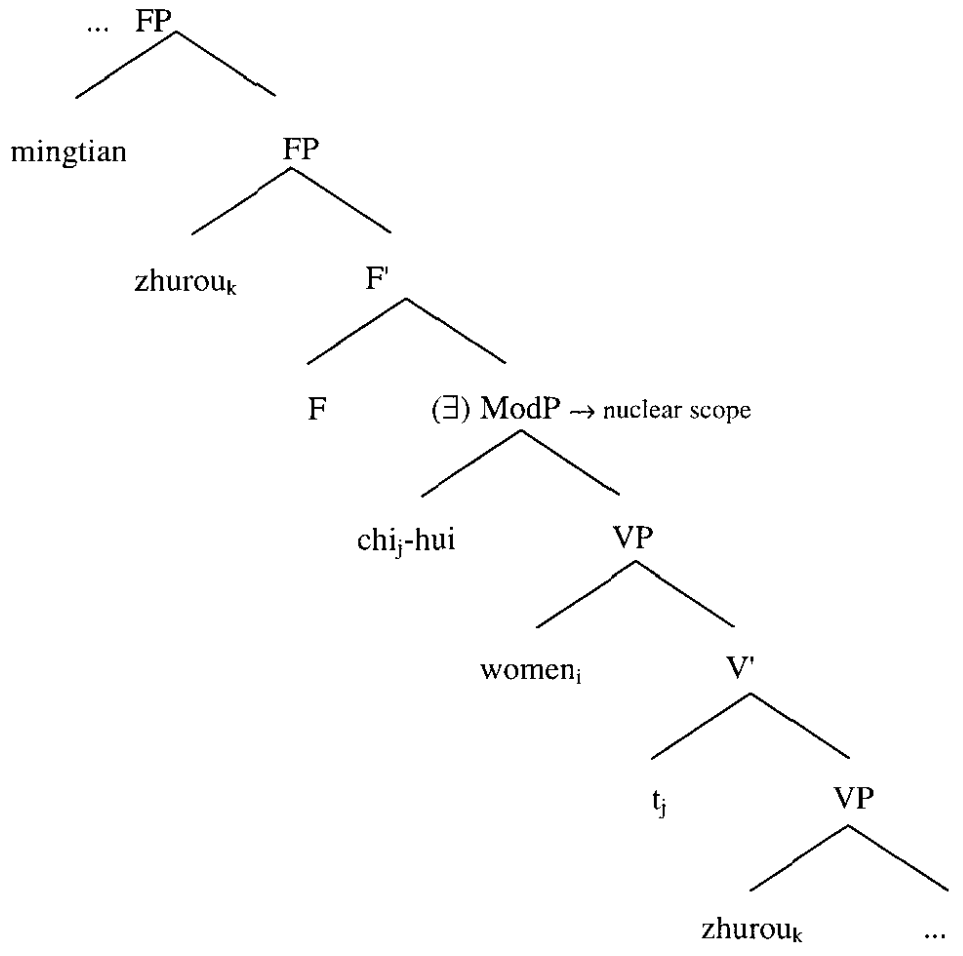
(33) women mingtian **zhurou** chi, **niurou** bu chi.
we tomorrow pork eat beef not eat
a. '(As for the meat in the refrigerator,) tomorrow we will eat the pork, but not the beef.' (definite)
b. '(As for dinner,) tomorrow we will eat pork, but not beef.' (nonspecific)

It is worthwhile to note that (33) can be paraphrased as (34) respectively with a future modal *hui* 'will' preceding the main verb:

(34) women mingtian **zhurou** hui chi, **niurou** bu hui chi.
we tomorrow pork will eat beef not will eat
a. (As for the meat in the refrigerator,) tomorrow we will eat the pork, but not the beef. (definite)
b. (As for dinner,) tomorrow we will eat pork, but not beef. (nonspecific)

Given what we have seen in (20b,c), where an fronted object indefinite is licensed through possibility modality, it is a simple deduction that it may also get licensing from a epistemic modal such as *hui*. This intuition translates into following two parts under our approach: Firstly, (33) has an implicit future modal locating between the object indefinites and the main verbs. This modal, implicit or not, is the locus of the irrealis tense in Chinese. Secondly, the nonspecific readings of (33) should be credited to existential closure on ModP, as illustrated by the diagram (35):

(35)




Namely, ModP serves as a syntactic predicate after V raises to Mod in LF, and effectively extends the nuclear scope from V' to ModP.

As we have demonstrated in the previous sections, there are essentially two ways to interpret an object chain link in terms of Copy Theory: If LF deletion applies to the lower copy, the only option left for the bare NP *zhurou* 'pork' is to get strongly quantified, since the upper copy is outside the domain of existential closure. This accounts for the definite readings of (33a). Alternatively, if it is the upper copy that undergoes LF deletion, then the lower copy benefits from the licensing from existential closure, resulting in the nonspecific readings of (33b).[5]

With the realis sentence (6) (repeated here as (36)), on the other hand, we run into the same type of problem encountered in (20a), except that this time around, bare NPs have one

[5] It appears that our theory also provide a solution for the object specificity displayed by the Dutch sentences (i) and (ii):

(i) Rudy hoopt dat Onno morgen **zes** **brieven** verscheurt.
Rudy hopes that Onno tomorrow six letters tears up
'Rudy hopes that Onno will tear up six letters tomorrow.' (specific, nonspecific)

(ii) Rudy hoopt dat Onno **zes** **brieven**$_k$ morgen t$_k$ verscheurt.
Rudy hopes that Onno six letters tomorrow tears up
'Rudy hopes that Onno will tear up six letters tomorrow.' (specific)

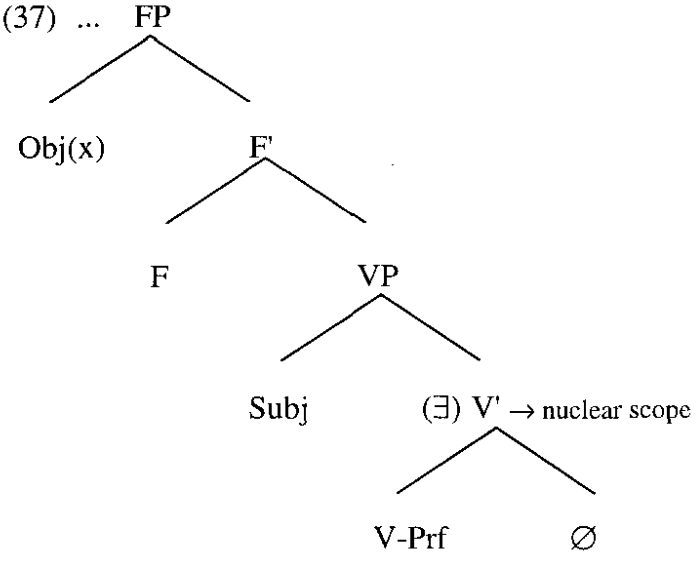
As observed by Reuland (1988), the numeral object NP of (i) can be either specific or nonspecific. If Bobaljik & Jonas's (1996) version of Holmberg's generalization is on the right track, the numeral NP has already undergone object shift to a VP-external position. By contrast, when we raise the numeral NP further over the temporal adverbial *morgen* 'tomorrow', only the specific reading is available. In this case, Dutch differs from Chinese only in that the numeral can be construed as a strong determiner.

more reading to keep the derivation alive, i.e., the definite interpretation of (36a):

(36) women zuotian **zhurou** chi-le, **niurou** mei chi.
we yesterday pork eat-Prf beef have-not eat
a. '(As for the meat in the refrigerator,) yesterday we have eaten the pork, not the beef.' (definite)
b.# '(As for dinner,) yesterday we have eaten pork, not beef.' (nonspecific)

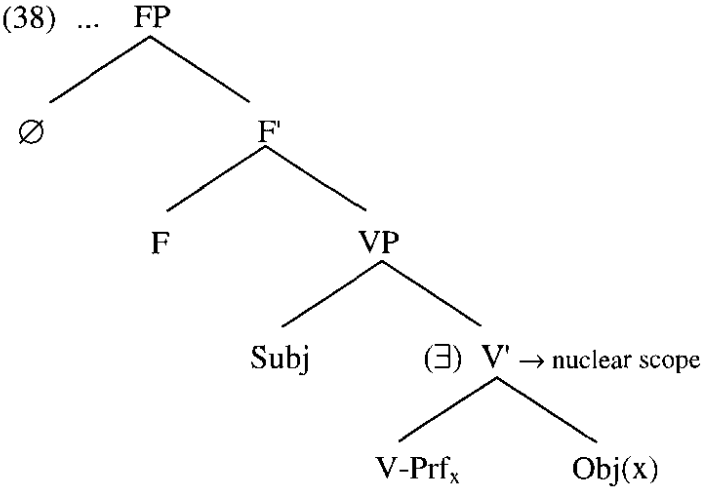
When the bare object NP gets interpreted as definite, it doesn't matter whether it is the upper or lower copy that undergoes LF deletion, since it does not rely on existential closure to remain legitimate. By contrast, when the bare object NP gets interpreted as indefinite, the licensing conditions vary, depending on which copy is deleted at LF: When LF deletion applies to the lower copy, the variable introduced by the upper copy is left unbound, causing vacuous quantification, as shown by (37):

(37) ... FP



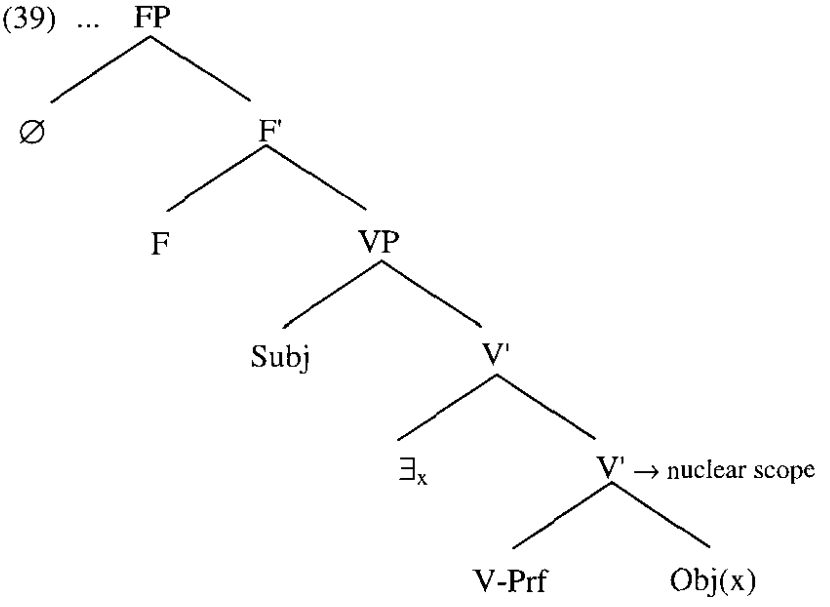

When LF deletion applies to the upper copy, the situation becomes relatively complicated, as illustrated below:

(38) ... FP



Here the lower copy is subject to the licensing from the perfective aspect *-le*, which would results in a specific reading. This option, as we have shown in section 4, is nonetheless incompatible with the semantics of Chinese bare NPs. The problem, therefore, is reduced to why the lower object copy cannot be bound by existential closure as a last resort, producing a nonspecific reading, as visualized in (39):

(39) ...




Here we would like to entertain the possibility that the licensing from existential closure is blocked by the perfective operator, which serves as a potential unselective binder. We thus have a classic case of relativized minimality violation. It turns out that the only reading available for (36) is definite, which is a desirable result.

Finally, we still have to deal with the question why the nonspecific readings are completely ruled out for pre-adverbial object indefinites. To begin with, I would like to point that (9) and (10) pattern with left dislocation structures like (40a) in allowing a resumptive pronoun:

(40) a. $\text{Akiu}_k$ (a), wo taoyan ($\text{ta}_k$).
Akiu Top I hate him
'As for Akiu, I hate him.'

b. wo $\text{Akiu}_k$ taoyan (*$\text{ta}_k$), $\text{Xiaodi}_j$bu taoyan (*$\text{ta}_j$).
I Akiu hate him Xiaodi not hat him
'I hate Akiu, but not Xiaodi.'

Object shift, on the other hand, disapproves the resumptive strategy, as evidenced by (40b). This observation holds regardless of the choice of tense, as indicated by the contrast of (41a,b) and that of (42a,b):

(41) a.? wo **Akiu**$_k$ zuotian jian-guo $\text{ta}_k$, ...
I Akiu yesterday meet-Exp him
'As for Akiu, I met him yesterday, ...

b.* wo zuotian **Akiu**$_k$ jian-guo ta$_k$ , ...
I yesterday Akiu meet-Exp him

(42) a.? wo **Akiu**$_k$ mingtian hui jian-dao ta$_k$ , ...
I Akiu tomorrow will meet-reach him
'As for Akiu, I will meet him tomorrow, ...

b.* wo mingtian **Akiu**$_k$ hui jian-dao ta$_k$ , ...
I tomorrow Akiu will meet-reach him

All these point to the conclusion that the seeming object on the pre-adverbial position is in fact a discourse topic, which is either specific or definite by nature. Since a bare NP can never be construed as specific, we correctly predict that the (9) and (10) only allow a definite interpretation.

Our position is further strengthened by the fact that numeral NPs cannot appear higher than temporal adverbials, as evidenced by (43) and (44):

(43) * wo **liang-ben shu** zuotian nian-guo,
I two-Cl book yesterday read-Exp
**san-ben shu** qiantian nian-guo.
three-Cl book the day before yesterday read-Exp
'I read two books, not three.'

(44) * wo **liang-ben shu** mingtian nian-de-wan,
I two-Cl book tomorrow read-can-finish
**san-ben shu** houtian nian-de-wan.
three-Cl book the day after tomorrow read-can-finish
'I can finish two books tomorrow, and three the day after tomorrow.' (nonspecific)

The phenomenon would make sense if the pre-adverbial position hosts a discourse topic, for which a numeral NP by itself can never be qualified.

## 7 Concluding Remarks

To sum up, we have demonstrated that the object specificity follows from the same principle as the subject specificity under the EMH. Furthermore, the semantic discrepancy between the realis and irrealis object shift constructions turns out to be a subcase of the more general indicative-modal asymmetry. Although our analysis presented here is nothing but conclusive, it does suggest that the EMH is a potent candidate for explaining the indicative-modal asymmetry, as well as for building a general theory of the specificity effects in question.

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# The Structures of Depictive and Resultative Constructions in Chinese*

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## Abstract

In this paper I firstly argue that secondary predicates are complement of v, and v is overtly realized by Merge or Move in secondary predication in Chinese. The former option derives the *de*-construction, whereas the latter option derives the V-V construction. Secondly, I argue that resultatives are hosted by complement vPs, whereas depictives are hosted by adjunct vPs. This complement-adjunct asymmetry accounts for a series of syntactic properties of secondary predication in Chinese: the position of a secondary predicate with respect to the verb of the primary predicate, the co-occurrence patterns of secondary predicates, the hierarchy of depictives, the control and ECM properties of resultative constructions, and the locality constraint on the integration of secondary predicates into the structure of primary predication. Thirdly, I argue that the surface position of *de* is derived by a PF operation which attaches *de* to the right of the leftmost verbal lexical head of the construction. Finally, I argue that in the V-V resultative construction, the assumed successive head-raising may account for the possible subject-oriented reading of the resultative predicate, and that the head raising out of the lower vP accounts for the possible non-specific reading of the subject of the resultative predicate.

## 1 Introduction

This paper discusses the syntactic structures of depictive and resultative constructions in Chinese. According to Halliday (1967: 63), resultatives describe a resultant state which is caused by the action denoted in the primary predication, whereas depictives describe the state of their subject at the time when the action denoted by the primary predication occurs. In Chinese, depictives precede whereas resultatives follow the verb of primary predication (Vpri hence), respectively. In (1) the resultatives follow the Vpri *da* 'beat', whereas in (2) the depictives precede the Vpris *zhuo* 'catch' and *he* 'drink'.[1] Both resultative and depictive constructions are represented in either the *de*-construction, where the functional word *de* occurs, or the V-V construction, where the lexical head of the secondary predicate is adjacent to Vpri. The a-sentences in (1) and (2) are in the V-V construction, whereas the b-sentences there are in the *de*-construction. We can also see that in the resultative *de* construction, *de* is right-adjacent to the Vpri, as in (1b); whereas in the depictive *de* construction, *de* is right-adjacent to the depictive, as in (2b). [2]

* For helpful comments on this paper, I am grateful to Chris Wilder, Anatoli Strigin, and Gerhard Jäger. All remaining errors are mine.

[1] The abbreviations used in the Chinese examples are: EXP: experience aspect, PRF: perfect aspect, PROG: progressive aspect, BA: causative particle, CL: classifier, MOD: modification marker.

[2] Pre-Vpri *de* and post-Vpri *de* are graphically different in Mandarin Chinese and phonologically different in some Chinese dialects. However, the different phonological or written forms do not mean that they are syntactically different. The different forms can be viewed as positional variants of the same category, as we often see in phonology. Crucially, the two forms of *de* occur in non-primary predication only, and they themselves do not have any semantic features to distinguish each other.

(1) a. Wusong da si le laohu. (resultative, V-V)
Wusong beat die PRF tiger
'Wusong beat the tiger so that it died.'
b. Wusong da de laohu liuxue le. (resultative, *de*)
Wusong beat DE tiger bleed PRT
'Wusong beat the tiger so that it bled.'

(2) a. Wusong huo zhuo le yi zhi laohu. (depictive, V-V)
Wusong alive catch PRF one CL tiger
'Wusong caught a tiger alive.'
b. Wusong rere de he le yi wan jiu. (depictive, *de*)
Wusong hot DE drink PRF one bowl wine
'Wusong drank a bowl of wine hot.'

This paper will make three claims. First, both depictives and resultatives are base-generated as complement of a functional head, which is realized either by the word *de* or head-raising. Second, depictive constructions have an adjunct control structure, whereas resultative constructions have either a complement control or ECM-like structure. Finally, the surface position of *de* is derived by a PF operation which attaches *de* to the right of the leftmost verbal lexical head of the construction. Following Hornstein (2001: 103), no null operator for the syntactic structure of predication is assumed in this study.

In section 2, I will argue that the phrase that hosts secondary predicates is a functional category. In section 3, I will show that this functional phrase is merged as a complement of Vpri in resultative constructions and as an adjunct of the structure of the primary predication in depictive constructions. The surface positions of *de* and the secondary predicate in the V-V construction are discussed in section 4. In section 5, the subject-orientation of resultatives, and the possible nonspecific reading of the subject of resultatives, in the V-V construction, are accounted for by the effect of head-raising. The paper is concluded in section 6.

## 2 The functional phrase in secondary predication

The following two assumptions have been proposed by Hornstein & Lightfoot (H&L 1987) and Bowers (1993, 1997, 2000), among others. First, the phrase hosting a resultative or a depictive is a functional phrase. Second, a secondary predicate is the complement of the head of the functional phrase. In 2.1, I introduce the alternation between two constructions of secondary predication in Chinese, supporting these two assumptions. In 2.2, I claim that the functional phrase is vP.

### 2.1 The projection of a functional phrase in secondary predication

My first argument for the projection of a functional phrase is that secondary predicates such as depictives and resultatives in Chinese are represented in either the so-called *de*-construction, where the functional word *de* occurs, or the V-V construction, where Vpri is adjacent to the lexical head of the secondary predicate. In the following data, the secondary predicates in (3) and (4) are resultatives, and those in (5) and (6) are depictives. (3) and (5) are in the V-V construction, while (4) and (6) are in the *de*-construction.

If we classify these data according to the relevant position of the secondary predicates to Vpri, the resultatives in (3) and (4) are to the right of Vpri, whereas the depictives in (5) and (6) are to the left of Vpri. We will discuss this order issue in section 3.1. If we classify these data according to the orientation of the subject of the secondary predicates, we see that the secondary predicates in the a-sentences of (3) through (6) are subject-oriented, those in the

b-sentences of (3) through (6) are object-oriented, and those in (3c) and (4c) have a subject independent of the argument structure of Vpri.

(3) a. Akiu ku lei le.
Akiu cry tired PRF
'Akiu cried and as a result he felt tired.'

b. Akiu da shang le Fanjin.
Akiu beat wound PRF Fanjin
'Akiu beat Fanjin so that Fanjin was wounded.'

c. Akiu ku shi le shoujuan.
Akiu cry wet PRF handkerchief
'Akiu cried and as a result the handkerchief was wet.'

(4) a. Akiu wanr de wang le zuoye.
Akiu play DE forget PRF homework
'Akiu played so much that he forgot the homework.'

b. Akiu kua de Fanjin buhaoyisi le.
Akiu praise DE Fanjin embarrassed PRF
'Akiu praised Fanjin so that Fanjin felt embarrassed.'

c. Akiu ku de shoujuan ye shi le.
Akiu cry DE handkerchief also wet PRF
'Akiu cried and as a result the handkerchief was wet.'

(5) a. Jia Zheng zai nu da Baoyu.[3]
Jia Zheng PROG angry beat Baoyu
'Jia Zheng is beating Baoyu angry.'

b. Akiu huo zhuo le Nanbatian.
Akiu alive catch PRF Nanbatian
'Akiu caught Nanbatian alive.'

(6) a. Akiu hulihutu de mai le yi bao shipin.
Akiu confused DE buy PRF one package food
'Akiu bought a package of food confused.'

b. Akiu lala de chi le yi wan Dandan-mian.
Akiu spicy DE eat PRF one bowl Dandan-noodle
'Akiu ate a bowl of Dandan-noodle spicy.'

The alternation between the *de*-construction and the V-V construction of secondary predication is further shown by the unacceptability of (7) below. (7a) is neither a V-V construction nor a *de*-construction, whereas (7b) has both *de* and a V-V form. Both sentences are intended to encode a resultative meaning.

(7) a. *Baoyu da na ge haizi haotaodaku.
Baoyu beat that CL child cry.loudly

b. *Baoyu da ku de na ge haizi.
Baoyu beat cry DE that CL child
Intended: 'Akiu beat that child so that the child cried.'

[3] Adjectives are not morphologically different from adverbs in Chinese. Thus the subject-oriented *nu* 'angry' and *hulihutu* 'confused' in (6a) and (6b) respectively can also be manner expressions. Thus these sentences are ambiguous. In this paper, I discuss the argument-depictive reading of these sentences only. See Dechaine (1993) section 3.3.3.2 'Manner adverbs as (derived) event depictives' for a discussion of the semantic and syntactic relations between subject-oriented adjective depictives and the corresponding *–ly* adverbs in English.

To capture this alternation, I assume that in Chinese, a functional phrase FP (to be specified in section 2.2) is projected in secondary predication, and F is realized by either *de* or a lexical head raised to F, as shown in (8a) and (8b), respectively.[4]

(8) a. $[_{FP}\ [_{F'}$ de $[_{XP}\ ]]]$ b. $[_{FP}\ [_{F'}\ X_i\ [_{XP}\ [_{V'}\ t_i\ ]]]]$

My second argument for FP is that within the same type of secondary predication, a resultative one or depictive one, the *de* construction and the V-V construction share many syntactic properties, indicating that the two constructions are derived in similar ways. The projection of FP in both constructions and the similar way of integration of the FP into the structure of primary predication represent their syntactic similarities.

The two resultative constructions, the V-V and the *de*-construction, for instance, share at least the following six properties, calling for a unitary treatment. First, if Vpri is intransitive, and there is no other overt nominal to serve as a subject of the resultative, the null subject of the resultative in both the *de* and the V-V constructions must be co-referential with the subject of Vpri. In the following b-sentences, the null subject of the resultative must be co-referential with *Akiu* rather than any other person.

(9) a. Akiu shui de zhentou dou diao di-shang le.
Akiu sleep DE pillow even fall land-on PRF
'Akiu slept and as a result even the pillow fell on the ground.'

b. Akiu shui de yuntouzhuanxiang. (*de*)
Akiu sleep DE dizzy
'Akiu slept and as a result he felt dizzy.'

(10) a. Akiu ku xing le Taotao.
Akiu cry awake PRF Taotao
'Akiu cried and as a result Taotao got awake.'

b. Akiu ku xing le. (V-V)
Akiu cry awake PRF
'Akiu cried (in his dream) and as a result he got awake.'

Second, if the object of Vpri is absent, the verb is detransitivized, and the null subject of the secondary predicate must be co-referential with the subject of Vpri. In (11), the null subject of *lei* 'tired' is co-referential with *Taotao*, rather than the implicit patient of the Vpri.

(11) a. Taotao$_i$ zhui de hen lei. (*de*)
Taotao chase DE very tired
'Taotao$_i$ chased X$_j$ and as a result {he$_i$/*X$_j$} got tired.'

b. Taotao$_i$ zhui lei le. (V-V)
Taotao chase tired PRF
'Taotao$_i$ chased X$_j$ and as a result {he$_i$/*X$_j$} got tired.'

The above two points follow the general constraint on resultatives that their subject must have an overt antecedent (Carrier & Randall 1992: 215, Rothstein 2000a). We will say more about this issue in section 3.4.2.

Third, in neither construction does the subject of the resultative predicate need to be the patient of the Vpri, which can be transitive in other contexts.

[4] Based on the alternation between the *de* and the V-V foms in resultative constructions, Sybesma (1999: 19) proposes that ExtP (Extent Phrase) is projected. The current study extends his ExtP to a more general functional phrase to cover the syntactic structures of all types of secondary predicate constructions.

(12) a. Akiu ti de qiuxie dou po le. (*de*)
Akiu kick DE sneaker even broken PRF
'Akiu kicked so much that even the sneakers were broken.'
Akiu ti po le qiuxie. (V-V)
Akiu kick broken PRF sneaker
'Akiu kicked so much that the sneakers were broken.'

(13) a. Akiu chi de ta fuqin dou mei qian le. (*de*)
Akiu eat DE he father even not.have money PRF
'Akiu ate and as a result his father even had no money.'
b. Akiu chi qiong le ta fuqin. (V-V)
Akiu eat poor PRF he father
'Akiu ate and as a result his father became poor.'

As noted by Cheng (1997), *qiuxie* 'sneaker' in (12) is not the patient of the verb *ti* 'kick'. What Akiu kicked is a football, not his sneakers. Similarly, in (13), *ta fuqin* 'his father' is not the patient of the verb *chi* 'eat'. In both cases, the Vpris function like intransitive verbs. Data like (12) and (13) call for a unified approach to the two resultative constructions. Similar data in English, as shown in (14), are treated as constructions where Vpri is intransitive in Bowers (1993: 621).

(14) John drank himself/ his friends under the table.

Fourth, in both the V-V and the *de*-construction, the subject of Vpri can be a causer rather than an agent. In the following (15), the subject is both a causer and a patient; whereas in (16), the subject is simply a causer.

(15) a. zhe dun fan chi de Akiu hen bao. (*de*)
This CL meal eat DE Akiu very full
'Akiu ate the meal and as a result he got very full.'
Lit: 'This meal ate Akiu very full.'
b. zhe shou ge chang hong le Akiu. (V-V)
This CL song sing red PRF Akiu
'Akiu sang this song and as a result he became famous.'
Lit: 'This song sang Akiu red.'

(16) a. zhe ju hua xiao de Akiu liuchu-le yanlei. (*de*)
this CL sentence laugh DE Akiu come.to-PRF tear
'This sentence got Akiu to laugh so much that he came to tears.'
Lit: 'This sentence laughed Akiu to tears.'
b. ta xiao si wo le. (V-V)
he laugh die I PRF
'He made me laugh to the extent that I felt dead.'
Lit: 'He laughed me dead.'

In the current literature, a causer is base-generated at Spec of vP. It does not need to be an agent, and it does not need to interact with the structure below vP. In addition, verbs like *chi* 'eat' or *chang* 'sing' do not assign an agent theta role. An agent, if it occurs, gets its theta role from v (Kratzer 1994). Huang (1994, 1997: 56) indeed assumes that the causer subject of the *de*-constructions like (16a) is merged at a higher verbal projection, although he does not apply his analysis to the V-V construction. A unified approach to the two constructions proposed here correctly predicts that the two constructions can have the same type of vP projection in the structure of their primary predication.

Fifth, if the subject of Vpri is a non-causer theme, no agentive adverbial such as *guyi* 'deliberately' is allowed. Compare (17), where the subject of the Vpri is a non-causer theme, with (18), where the subject of the Vpri is an agent:

(17) a. tudou (*guyi) dun de hen lan. (*de*)
potato deliberately stew DE very pappy
'The potatoes were stewed pappy (*deliberately).'

b. tudou (*guyi) dun lan le. (V-V)
potato deliberately stew pappy PRF
'The potatoes were stewed pappy (*deliberately).'

(18) a. Akiu guyi da de erzi haotaodaku. (*de*)
Akiu deliberately beat DE son cry.loudly
'Deliberately, Akiu beat the son so that the son cried loudly.'

b. Akiu guyi da po le yi ge beizi. (V-V)
Akiu deliberately hit broken PRF one CL cup
'Deliberately, Akiu hit a cup so that it was broken.'

According to Den Dikken & Sybesma (1998), the ban of an agentive adverbial and the absence of the causative meaning in sentences like (17) indicate that vP, which hosts either an agent or causer, is not projected in the structure of the primary predication. Similar data can be found in Yorùbá (Dechaine 1993: 4.3.3), and Japanese (Nishiyama 1998: 189). As pointed out correctly by Nishiyama (1998: 199) "it is *not* that 'a transitive verb must have the external argument', but it is the *other way around*: the external argument must have a transitive verb." It is possible that the null subject of the secondary predicate is co-referential with the theme internal argument of the Vpri, which surfaces as the subject of the Vpri. The same constraint on the V-V and the *de*-construction again calls for a unified treatment of the two constructions.

Sixth, the *de*-construction and the V-V construction show the same pattern of A'-movement possibilities. Audrey Li (1999) presents quite a few arguments to show that topicalization in Chinese can be a movement operation. I adopt her conclusion as a background assumption. The following contrast between (19a) and (19b) shows that the internal argument of Vpri can be topicalized whereas the subject of a resultative which is not co-referential with any argument of the Vpri cannot be topicalized. The contrast between (19c) and (19d) shows that the internal argument of Vpri can be relativized, whereas the subject of a resultative which is not co-referential with any argument of the Vpri cannot be relativized.

(19) a. na ben shu$_i$ Akiu kan de t$_i$ dou lan le.
that CL book Akiu read DE even broken PRF
'That book, Akiu read and as a result it was broken.'

b. *Taotao$_i$ Akiu ku de t$_i$ hen shangxin.
Taotao Akiu cry DE very sad

c. Akiu kan de t$_i$ dou po le de na ben shu$_i$
Akiu read DE even broken PRF MOD that CL book
'the book that Akiu read and as a result became broken.'
Lit: 'the book that Akiu read broken'

d. *Akiu ku de t$_i$ hen shangxin de na ge ren$_i$
Akiu cry DE very sad MOD that CL person
Lit: 'the person that Akiu cried sad'

The same contrasts are observed in the V-V construction:

(20) a. Na ge beizi$_i$, Akiu da po le $t_i$.
that CL cup Akiu hit broken PRF
'That cup, Akiu hit and as a result it was broken.'
b. *Akiu$_i$, Taotao ku xing le $t_i$.
Akiu Taotao cry awake PRF
c. Akiu da po le $t_i$ de na ge beizi$_i$
Akiu hit broken PRF MOD that CL cup
'the cup that Akiu hit and as a result became broken'
d. *Taotao ku xing le $t_i$ de na ge ren$_i$
Taotao cry awake PRF MOD that CL person

In fact, the subjects of the resultative predicates in (12), (13), (15), and (16) cannot undergo topicalization and relativization, either. They all pattern with the data where Vpri is intransitive. I will discuss this extraction issue in section 3.4.3.

Based on the above six similarities between the *de*-construction and the V-V construction, I propose a unitary analysis of the two resultative constructions: a functional phrase FP is projected, and although the head of FP is realized differently, the integration of FP into the structure of the primary predication is the same.

The shared syntactic properties of the two constructions, on the other hand, are in concord with the assumption of the Distributive Morphology framework (Marantz 1997) that compound words are derived in the computational component rather than in the lexicon. My unitary syntactic approach is thus different from Yafei Li's (1990, 1998, 1999) non-unitary approach, which deals with the V-V construction in the lexicon. For a discussion of the problems of the lexical approach, see Zou (1994) and Cheng (1997), among others.

## 2.2 The nature of the assumed functional phrase

The conclusion made in the last subsection supports H&L and Bowers' assumption that there is a projection of a functional phrase in secondary predication. H&L claim that the phrase is IP, whereas Bowers claims that it is PrP. I will, however, use v to represent the functional head, instead of H&L's Infl and Bowers' Pr, for the following reasons.

H&L (p. 28) assume that Infl, like all other heads, can be followed by any phrasal category as a complement, and that if Infl is [±tense], the complement must be a VP; if Infl is empty, as in the non-primary predication constructions under discussion, the complement may be NP, PP, or AP, but not VP. First of all, however, this category contrast between primary and non-primary predicates is not universal (Dechaine 1993). In Chinese, a primary predicate can be a category other than VP, as shown by the AP predicate *hen gao* 'very high' in (21a), and a secondary predicate can be a VP, as shown by the VP resultative *liuxu* 'bleed' in (21b).

(21) a. gongshui yijing (*shi) hen gao le.
flood already be very high PRT
'The flood has reached to a very high level.'
b. Wusong da de laohu liuxue le. (= 1b)
Wusong beat DE tiger bleed PRT
'Wusong beat the tiger so that it bled.'

Moreover, H&L claim that the Infl in primary predicates has [±tense] features, whereas the empty Infl in non-primary predicates does not. If so, one wonders why an IP headed by such an empty and featureless Infl is projected in the structure of non-primary predication at all. I do not claim that the head of the functional phrase in (8) is Infl, because the way the functional head is realized is not sensitive to a tense or finiteness contrast.

I do not adopt Pr either, because it is not clear how to distinguish Pr from v, because we have no evidence that v and Pr can co-occur, and because what Pr can do can be covered by v, which is motivated independently anyway.

One might wonder why there is no *de*-V-V alternation in a vP which encodes primary predication. The situation may be similar to the realization of the functional head related to a yes-no question in English. According to Chomsky (1995), *if* realizes this functional head. However, it never occurs in a root yes-no question.

I conclude this section by claiming that vP is projected in the structure of secondary predication. In Chinese, v is realized by either *de* or a head-raising in secondary predication.

One may assume that the choice between the *de*-merger and head-raising is determined in the Array (Chomsky 1998, 1999), in the sense that if *de* is present in the Array, the *de*-construction is derived; whereas if *de* is absent there, a head-raising occurs. Alternatively, one can assume that *de*, like *do* of the *do*-support in English, is a formative not present in the Array, and is used only when head-raising is impossible (cf. Chomsky 1957, Arnold 1995, Hornstein 2001: 184 on this analysis of the *do*-support). A typical case where head-raising is impossible is when the XP selected by v contains a degree word *hen* 'very', as in (22).

(22) a. Lao Wang pao de hen lei.
Lao Wang run DE very tired
'Lao Wang run so that he got very tired.'
b. *Lao Wang pao lei hen.
c. *Lao Wang pao hen lei.

The choice of the *de*-construction rather than the V-V construction in (22) follows the constraint on head movement that no modifier can be stranded (Hoekstra 1988, see Sybesma 1999: 21).

# 3 Adjunct vP vs. Complement vP

Resultatives have been argued to be base-generated inside a complement of Vpri in English (Hoekstra 1988, Larson 1991a, Bowers 1993, 1997, 2000, among many others) and Japanese (Koizumi 1994). Subject-oriented depictives have been generally claimed to be base-generated inside an adjunct of a verbal projection of the primary predication in both English and Japanese (H&L 1987, Larson 1991a, Bowers 1993, 1997, 2000, Koizumi 1994). The base-position of object-oriented depictives, however, is under debate. Some including H&L and Bowers, assume that object-oriented depictives are hosted by adjuncts of a verbal projection of the primary predication, whereas others, including Williams (1980), Culicover & Wilkins (1984), Roberts (1988), Larson (1991a), and Koizumi (1994) claim that object-oriented depictives have the same structure as that of resultatives, i.e., they are hosted by a complement of Vpri.

In this section I show that in Chinese, the vP which hosts resultatives is a complement of Vpri, whereas the one that hosts depictives, regardless of whether the depictive is subject-oriented or object-oriented, is an adjunct of the structure of primary predication.

## 3.1 The position with respect to Vpri

In English, a VO language, secondary predicates are to the right of Vpri, as shown in (23). The resultative predicate *flat* is to the right of the Vpri *watered* in (23a), and the depictive predicate *raw* is to the right of the Vpri *ate* in (23b). In German as well as in Japanese, both

OV languages, both types of predicates precede Vpri (abstracting away from V2). The German data in (24) show this point.

(23) a. John watered the tulip flat. (resultative)
b. John ate the fish raw. (depictive)

(24) a. Frank hat den Tisch sauber gewischt. (resultative)
Frank has the table clean wiped
b. Frank hat das Fleisch roh geschnitten. (depictive)
Frank has the meat raw cut

In Chinese, however, depictives precede, while resultatives follow, Vpri, as shown in the contrast between (2) and (1). In the *de*-construction, the former also precede *de*, while the latter also follow *de*. The surface positions of *de* will be argued to be decided at PF (section 4.2). Here I only consider the position of a secondary predicate with respect to Vpri.

The positions of secondary predicates are strict with respect to Vpri in Chinese, and may provide information about the integration of the vP argued for in section 2 into the structure of primary predication. In Chinese, complements of a verb occur to the right of the verb in unmarked cases, whereas adverbials of a verb occur to the left of the verb, as illustrated in (25a) and shown in (26). Similarly, as illustrated in (25b) and shown in the data in (27) as well as other Chinese data in this paper, resultatives occur to the right of Vpri while depictives occur to the left of Vpri.

(25) a. adverbial V complement
b. depictive V resultative

(26) a. Akiu {zuotian/like} xi le na jian chenshan.
Akiu yesterday/immediately wash PRF that CL shirt
'Akiu washed that shirt {yesterday/immediately}.'
b. *Akiu xi le na jian chenshan {zuotian/like}.
Akiu wash PRF that CL shirt yesterday/immediately

(27) a. Akiu qihuhu de ti de men zhi yaohuang.
Akiu angry DE kick DE door continuously shake
'Akiu kicked the door shaky angry.'
b. *Akiu zhi yaohuang de ti de men qihuhu.
Akiu continuously shake DE kick DE door angry

These data show that depictives occur in a typical adverbial position, and resultatives occur in a typical complement position. The syntactic positions of depictives and resultatives with respect to Vpri in Chinese suggest that in the integration of a secondary predication into a primary one, depictives are hosted by a vP which is an adjunct of primary predicate, whereas resultatives are hosted by a vP which is a complement of Vpri.

## 3.2 The co-occurrence restriction

Resultatives do not co-occur with resultatives, while depictives can co-occur with depictives, as shown in (28). The restriction in English is discussed in Simpson (1983) and Rothstein (1985). The same contrast is observed in Chinese, as shown in (29).

(28) a. *John kicked the door open to pieces. (resultative)
b. They ate the meat raw tender. (depictive)

(29) a. *Akiu da de Baoyu haotaodaku shou le shang. (resultative)
Akiu hit DE Baoyu cry.loudly suffer PRF wound

b. Akiu huoshengsheng de xinglixingqi de chi le na tiao yu. (depictive)
Akiu alive DE stinky DE eat PRF that CL fish
'Akiu ate that fish alive stinky.'

According to Winkler's (1997:7) semantic account, (28a) is unacceptable because resultatives are delimiting expressions and an event can only be delimited once in a sentence, whereas (28b) is acceptable because depictives are not delimiting expressions, and thus the restriction does not apply. The contrast can also be accounted for structurally. It is generally assumed that an element cannot have two or more complements of the same type. The two complements, direct and indirect object, of a ditransitive verb bear different thematic roles. However, an element can have two or more adjuncts of the same type. The above co-occurrence contrast between resultatives and depictives in English and Chinese provides another argument for the distinctions between complement and adjunct phrases which host secondary predicates.

## 3.3 The hierarchy of depictives

In this subsection we show that like adverbials, different types of depictives are structurally ordered in a hierarchy showing the properties of adverbials.

First, multiple depictives are ordered. When multiple depictives co-occur, we see mirror images of the orders in English and Chinese: In English, the order is object-oriented depictive - subject-oriented depictive (Carrier and Randall 1992), while in Chinese the order is just opposite; however, in both languages, object-oriented depictives are closer to Vpri than subject-oriented ones, as shown in the following:

(30) a. V $\text{depictive}_{obj}$ $\text{depictive}_{sbj}$ (English)
b. $\text{depictive}_{sbj}$ $\text{depictive}_{obj}$ V (Chinese)

(31) a. $\text{John}_i$ sketched the $\text{model}_j$ $\text{nude}_j$ $[\text{drunk as a skunk}]_i$.
b. *$\text{John}_i$ sketched the $\text{model}_j$ $\text{nude}_i$ $[\text{drunk as a skunk}]_j$.

(32) a. $\text{Akiu}_i$ $\text{yukuai}_i$ de $\text{rere}_j$ de he le $[\text{na wan cha}]_j$.
Akiu happy DE hot DE drink PRF that bowl tea
'Akiu drank that bowl of tea hot happy.'
b. *$\text{Akiu}_i$ $\text{rere}_j$ de $\text{yukuai}_i$ de he le $[\text{na wan cha}]_j$.
Akiu hot DE happy DE drink PRF that bowl tea

In (31), the depictive *nude* is closer to the Vpri *sketched* than the depictive *drunk as a skunk*. In the acceptable (31a), the subject of *nude* is co-referential with *the model*, which is the object of the Vpri, and the subject of *drunk as a skunk* is co-referential with *John*, which is the subject of the Vpri. (31b), with the opposite co-indexing, is unacceptable. Thus the object-oriented depictive is closer to the Vpri than the subject-oriented one. In (32), there are also two depictive predicates, *rere* 'hot' and *yukuai* 'happy'. In both sentences the subject of *rere* is co-referential with *na wan cha* 'that bowl of tea', which is the object of the Vpri *he* 'drink', and the subject of *yukuai* is co-referential with *Akiu*, which is the subject of *he*. *Rere* is closer to *he* 'drink' than *yukuai* in the acceptable (32a), whereas it is the other way around in the unacceptable (32b). Like (31), (32) also shows that the object-oriented depictive is closer to the Vpri than the subject-oriented one.

The pattern of the orders is similar to that of adverbials. In the following data ((34) is from Hornstein 2001: 116) the adjunct which has a dependency relation with the object of the matrix verb must be ordered closer to the matrix verb than the adjunct which has a dependency relation with the subject of the matrix verb.

(33) a. John$_i$ arrested Bill$_j$ [for PRO$_j$ driving his car too fast] [after PRO$_i$ leaving the party]
b. ??John$_i$ arrested Bill$_j$ [after PRO$_i$ leaving the party] [for PRO$_j$ driving his car too fast]

(34) a. John$_i$ bought Moby Dick$_j$ [for Mary to review e$_j$] [PRO$_i$ to annoy Sam]
b. *John$_i$ bought Moby Dick$_j$ [PRO$_i$ to annoy Sam] [for Mary to review e$_j$]

There is no doubt that the non-finite clauses above are adverbials. Hornstein (2001: 97) claims that the adjunct which has a dependency relation with the object of the matrix verb is adjoined lower than the adjunct which has a dependency relation with the subject of the matrix verb. This difference in height indicates that the former has a closer structural relation to the matrix verb than the latter. In the linear order, the former is also closer to the matrix verb than the latter. The order restriction in (31) and (32) indicates that like the adverbials in (33)/(34), object-oriented depictives and subject-oriented depictives are ordered in a certain structural hierarchy. In H&L (1987: 27), the functional phrase hosting a subject-oriented depictive is a VP-adjunct, whereas the functional phrase hosting an object-oriented depictive is a V'-adjunct. The Chinese data in (31) and (32) are compatible with this distinction.

Second, the interactions with adverbs show the structural order of different types of depictives. For instance, subject-oriented depictives can occur to the left of the adverb *like* 'immediately', while object-oriented depictives cannot, as shown in (35):

(35) a. Akiu (like) gaoxing de (like) chang le yi shou ge.
Akiu immediately glad DE immediately sing PRF one CL song
'Akiu sang a song glad (immediately).'
b. Akiu (like) rere de (*like) he le yi bei cha.
Akiu immediately hot DE immediately drink PRF one cup tea
'Akiu drank a cup of tea hot (immediately).'

This restriction shows that the vP hosting the object-oriented depictive may be ordered lower than both the adverb and the vP hosting the subject-oriented depictive on the adverbial hierarchy, and thus has a closer structural relation with the Vpri.

The similarity of the order-patterns of depictives to the order-patterns of adverbials, and the interactions with other adverbs suggest that the vP hosting depictives has properties of adverbials. This order fact supports our claim that vPs which host depictives have an adjunct status in their integration into the structure of primary predication.

A remaining issue is what syntactic operation enables co-reference between the null subject of a depictive and an argument of Vpri. In other words, what are the syntactic representations of the so-called subject-orientation or object-orientation of a depictive predication? Following H&L, I assume that depictive constructions have a control-into-adjunct structure. In other words, the null subject of a depictive is a PRO, controlled by an argument of the relevant Vpri.

## 3.4 The control and ECM properties of resultative constructions

In this subsection, we show that resultative constructions are either in a complement-control or in an ECM structure.[5] This in turn suggests that the phrase hosting resultatives is merged as a complement of Vpri.

[5] Huang (1992) claims that resultative constructions have a control structure. I do not discuss his argumentation here since he uses many data of the causative BA-construction and the passive-like BEI-construction, which makes the issue complicated and unclear.

I argue for Bowers' (1993, 1997, 2000) claim that the resultative construction where the Vpri thematically selects the unique overt affected argument has a control structure whereas the construction where the Vpri does not do so is an ECM-like structure. I call the former construction TRC (Transitive Resultative Construction) and the latter IRC (Intransitive Resultative Construction). In (36a), the Vpri *wipe* selects the affected argument *the table*, thus (36a) is a TRC. In (36b), the Vpri *ran* does not select the affected argument *their Nikes*, thus (36b) is an IRC. The parallel Chinese resultative examples are (37) and (38), respectively.

(36) a. John wiped the table clean. (TRC)
b. The joggers ran their Nikes threadbare. (IRC)

(37) a. Akiu da si le laohu. (= 1a) (TRC, V-V)
Akiu beat die PRF tiger
'Akiu beat the tiger so that it died.'
b. Akiu da de laohu liuxue le. (= 1b) (TRC, *de*)
Akiu beat DE tiger bleed PRT
'Akiu beat the tiger so that it bled.'

(38) a. Akiu ku shi le shoujuan. (IRC, V-V)
Akiu cry wet PRF handkerchief
'Akiu cried and as a result the handkerchief was wet.'
b. Akiu ku de shoujuan ye shi le. (IRC, *de*)
Akiu cry DE handkerchief also wet PRF
'Akiu cried and as a result the handkerchief was wet.'

It is possible that the subject of a resultative predicate is a null form, as in (39).

(39) a. Akiu ku lei le. (= 3a)
Akiu cry tired PRF
'Akiu cried and as a result he felt tired.'
b. Akiu wanr de wang le zuoye. (= 4a)
Akiu play DE forget PRF homework
'Akiu played so much that he forgot the homework.'

Similar data have been presented in (9b), (10b), and (11). In these data, the null subject of the resultative predicate is co-referential with the subject of Vpri, rather than the implicit patient of Vpri, if there is one. This type of data should be given the same treatment as that of other IRCs.

### 3.4.1 Against the unitary approaches to TRC and IRC

In the current literature, the approach represented by Hoekstra (1988) and Sybesma (1999) treats the affected argument in both TRC and IRC as subject of the resultative predicate. In contrast, the approach suggested by Rothstein (2000a: 259) tends to treat the affected argument in both TRC and IRC as an object of the Vpri. The following discussion will argue against these two unitary approaches.

In Korean, the affected argument has accusative case in TRC, whereas a nominative case in IRC (Kim & Maling 1997: 191). In English, the differences between TRC and IRC are noted by Wilder (1991, 1994), Carrier & Randall (1992), and Rothstein (1992), among others. They found that the two constructions contrast in selectional restrictions, middle formation, nominalization, subjacency violation, and semantic entailment. They claim that the contrasts indicate that the affected argument is the object of the Vpri in TRC, whereas it is the subject of the resultative predicate in IRC. In Chinese, the same claim is argued for by Li (1998: 287). I provide two more arguments for this non-unitary approach: a contrast in the adjacency

between the Vpri and the affected argument, and a contrast in extraction of the affected argument.

A focussed object can be preposed to either the left or the right of the subject in Chinese:

(40) (lian mingzi$_i$) Akiu (lian mingzi$_i$) dou wang-le $t_i$
even name Akiu even name also forget-PRF
'Akiu forgot even the name.'

In a TRC, the object of the resultative predicate can only be preposed to the right of the affected argument, as shown in (41a). In an IRC, however, the object of the resultative predicate can be preposed to either the left or the right of the affected argument, as shown in (41b):

(41) a. Daiyu kua de (*lian mingzi$_i$) Baoyu (lian mingzi$_i$) dou wang-le $t_i$. (TRC)
Daiyu praise DE even name Baoyu even name also forget-PRF
'Daiyu praised Baoyu and as a result Baoyu forgot even the name.'
b. Daiyu ku de (lian mingzi$_i$) Baoyu (lian mingzi$_i$) dou wang-le $t_i$. (IRC)
Daiyu cry DE even name Baoyu even name also forget-PRF
'Daiyu cried and as a result Baoyu forgot even the name.'

The contrast is expected if *Baoyu* is the object of the Vpri in (41a), but the subject of the resultative predicate in (41b), because the pre-*Baoyu* nominal *lian mingzi* 'even name' is in the permitted clause-initial position in (41b), but illegitimately intervenes between the Vpri and its object in (41a), making the sentence unacceptable.

Another relevant contrast is the extraction contrast between TRC and IRC presented in (19) and (20). Specifically, extraction of an affected argument is possible in TRC, but not in IRC. We will discuss this contrast in section 3.4.3.

The above two contrasts between TRC and IRC strongly suggest that the two constructions have different structures. Following Rothstein (1992) and Levin & Rappaport Hovav (1995), among others, I will analyze the affected argument as a subject of the resultative predicate in IRC and as an object of the Vpri in TRC.

### 3.4.2 A control analysis of TRC

Chinese TRCs have both object-control and subject-control structures. For an object-control structure, consider (42):

(42) a. Akiu kan de zhe ben shu dou lan le.
Akiu read DE this CL book even broken PRF
'Akiu read this book and as a result the book even got broken.'
b. *Akiu kan de zhe ben shu dou bunaifan le.
Akiu read DE this CL book even impatient PRF

In (42), the affected argument *zhe ben shu* 'this CL book' is thematically selected by and is an object of the Vpri *kan* 'read'. The null subject of the resultative *dou lan le* 'even broken PRF' is co-referential with the object. This co-reference relation obeys the Minimal Distance Principle (MDP, Rosenbaum 1970) on control, which roughly states that a PRO selects as its controller the nearest c-commanding nominal. The nearest c-commanding overt nominal to the resultative predicate must be the controller of the PRO subject of the predicate. In (42a) the nominal is *zhe ben shu* 'this book' rather than *Akiu*. In (42b), however, MDP requires *zhe ben shu* 'this book' to be the controller of the PRO subject, but semantically this overt

nominal cannot be predicated of by the resultative predicate *bunaifan* 'impatient'. Consequently the predication fails.

One argument for the object-control construction of (42a) is that it obeys Bach's generalization (Bach 1979, Larson 1991b), which states that detransitivization is available with subject-control verbs but proscribed with object-control verbs.

(43) a. John promised (Mary) to leave. (subject-control)
b. John {persuaded/forced} *(Mary) to leave. (object-control)

As in (43b), if we remove the object from (42a), the sentence becomes unacceptable:

(44) *Akiu kan de dou lan le.
Akiu read DE even broken PRF

Bach's generalization captures the constraint that in obligatory control, PRO must have an overt antecedent (H&L 1987: 36). Returning to data like (11), repeated here as (45), we now can see why the subject of the resultative here cannot be co-referential with the implicit patient of the Vpri.

(45) a. $\text{Taotao}_i$ zhui de hen lei.
Taotao chase DE very tired
'$\text{Taotao}_i$ chased $X_j$ and as a result {$\text{he}_i$/*$X_j$} got tired.'
b. $\text{Taotao}_i$ zhui lei le.
Taotao chase tired PRF
'$\text{Taotao}_i$ chased $X_j$ and as a result {$\text{he}_i$/*$X_j$} got tired.'

In this respect, an obligatorily controlled PRO is like reciprocals and reflexives ((46a,b), Chomsky 1986), and unlike pronouns (46c) and a non-obligatorily controlled PRO (46d), which do not require an overt antecedent (H&L: 36, Hornstein 2001):

(46) a. $\text{They}_i$ decided to hit {each other/themselves}$_i$.
b. *Damaging testimony was given about {each other/themselves}.
c. The boat was sunk in order [that he could collect the insurance].
d. The boat was sunk [PRO to collect the insurance].

We have shown that data like (42) have object-control structures. The following data (adapted from Y. Li 1999: 448) exhibit properties of subject-control structures, i.e., the PRO subject of the resultative predicate is controlled by the nearest subject *Daiyu*.

(47) a. (Akiu zhidao) Daiyu deng de Baoyu $\text{PRO}_{\text{Daiyu}}$ zuolibu'an.
Akiu know Daiyu wait DE Baoyu restless
'(A. knew that) D. waited for B. and as a result D. became restless.'
b. (Akiu tingshuo) Daiyu xiang de Baoyu $\text{PRO}_{\text{Daiyu}}$ shuibuzhaojiao.
Akiu hear Daiyu miss DE Baoyu unable.sleep
'(A. heard that) D. missed B. so much that D. could not sleep.'

Like other resultative constructions, data like (47) describe a resultative state which is caused by the action denoted by the primary predication. According to Larson (1991b: 115, adopted in Bowers 2000: 321) and Hornstein (2001) the object of subject-control verbs does not c-command the PRO, since it is hosted by an adjunct of the verb. Thus MDP is not violated in the controlling of the PRO by *John* in *John promised Mary to leave* and *Akiu* in

(47).[6] Hornstein (2001: 64 fn 19) suggests that the object of *promise* is the object of a null preposition corresponding to the *to* in the nominal form in (48a), as shown in (48b):

(48) a. John's promise to Mary to leave
b. John promised [$_{PP}$ P Mary] [PRO to leave]

As in the object-control cases, MDP is obeyed in (47). The PRO is controlled by the nearest c-commanding nominal *Daiyu*, rather than *Akiu*, which is not a nearest c-commanding nominal.

In addition, Bach's Generalization is also observed. (49) shows that as in (43a), detransitivization of the Vpri in (47a) does not change the control pattern.

(49) Daiyu$_i$ deng de zuolibu'an.
Daiyu wait DE restless
'Daiyu$_i$ waited and as a result she$_i$ became restless.'

The following data show that the subject-control property of *deng* 'wait' and *xiang* 'miss' is kept in the V-V construction:

(50) a. Akiu$_i$ deng ji le Daiyu$_j$ PRO$_i$ (pro da dianhua wen zenme-huishi).
Akiu wait impatient PRF Daiyu make call ask what-thing
'Akiu$_i$ waited for Daiyu$_j$ so much that he$_i$ became impatient
(and then he made a phone call asking what happened)'
b. Akiu$_i$ xiang feng le Daiyu$_j$ PRO$_i$.
Akiu miss mad PRF Daiyu
'Akiu$_i$ missed Daiyu$_j$ so much that he$_i$ became insane.'

Subject-control verbs are less common than object-control verbs.[7] If the Vpris in (47) are replaced by other transitive verbs such as *kua* 'praise', *ma* 'scold', or *piping* 'criticize', the PRO subject of the resultative predicate will be controlled by the object *Baoyu* rather than the subject *Daiyu* (I will discuss the issue of subject-orientation of the V-V TRC in section 5.1).

### 3.4.3 A ECM analysis of IRC

Bowers (1993: 622, 1997: 45, 2000: 325) argues that in the English IRCs, the subject of the secondary predicate raises to the higher clause, as shown in (51):

(51) a. The joggers ran <u>their Nikes</u>$_i$ [$_{PRP}$ t$_i$ threadbare].
b. John ate <u>himself</u>$_i$ [$_{PRP}$ t$_i$ sick].

Based on the arguments presented in Lasnik & Saito (1991), Chomsky (1995) claims that an ECM structure is derived by movement of the embedded subject to a specifier position in the higher clause. The essence of Bowers' ECM analysis of IRCs is that the subject of the resultative predicate has a theta relation locally, whereas it has a Case relation with the primary predication, and thus behaves like an object of Vpri.

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[6] Larson (1991b) claims that subject-control verbs are ditransitive verbs. However, it has been pointed out to me that dative shift verbs other than *promise* still take object-control. For example, *tell* permits dative shift, as in *I told Mary the answer*, but *tell* is nevertheless an object-control verb, as in *John told Mary PRO to kill herself/*himself*. Thus in my present work I do not link the subject-control property of verbs such as *promise* to the dative shift property. In addition, Chinese verbs like *deng* 'wait' and *xiang* 'miss' have no dative shift property anyway:
(i) a. *Akiu deng le Baoyu yi feng xin. b. *Akiu xiang le Baoyu yi feng xin.
Akiu wait PRF Baoyu one CL letter Akiu miss PRF Baoyu one CL letter

[7] Acquisition evidence shows that subject-control verbs are marked in English (see Hornstein 2001: 35).

Bowers' analysis can be supported by the fact that the affected argument in IRC shows object properties. Rothstein (2000a: 256) uses the following evidence to show that the affected argument in IRC has properties of a direct object. As is well known, accomplishments can have an atelic reading if their direct object is a bare plural or a mass noun. She notes that the event denoted by IRC can be atelic if the affected argument is a bare plural or a mass noun. The data in (52) have atelic counterparts in (53):

(52) a. John sang the baby asleep.
b. The audience laughed the clown off the stage.
(53) a. John sang babies asleep for hours last night.
b. The audience was very cruel and laughed performers off the stage as fast as they could come on.

Since objects in Chinese do not raise overtly for Case reasons, I assume that if there is a Case relation between a verb and the subject of its complement clause (an ECM structure), the relevant Case checking is accomplished either by covert raising of the embedded subject or without any movement (Chomsky's (1998, 1999) Agree). I have three arguments for the ECM structure of IRC in Chinese. First, the affected argument in IRC has properties of a typical object. This is shown by the fact that such an argument can occur to the left of the Vpri in the BA construction, as in (54a). The affected argument in this sense is similar to an affected object of a transitive verb, as in (54b). Generally, nominals construed with an intransitive verb cannot occur in the BA construction, as shown in (55), where *shi* 'wet' and *qu* 'go' are intransitive verbs:[8]

(54) a. Akiu ba shoujuan ku de quan shi-le.
Akiu BA handkerchief cry DE complete wet-PRF
'Akiu cried and as a result the handkerchief was completely wet.'
b. Akiu ba mianbao chi-le.
Akiu BA bread eat-PRF
'Akiu ate the bread.'
(55) a. *Akiu ba shoujuan shi-le.
Akiu BA handkerchief wet-PRF
b. *Akiu ba Xizang qu-le.
Akiu BA Tibet go-PRF

Second, unlike in the *de*-TRC, the affected argument in the *de*-IRC can be nonspecific, and the available nonspecific reading is found in objects rather than subjects in Chinese (I will discuss the specificity issue of the V-V construction in section 5.2). The subject of a primary predicate, regardless of whether the predicate is individual-level or stage-level, cannot be nonspecific in Chinese generally (Li & Thompson 1981, Tsai 2001, among others), as shown in (56a). The same constraint is observed in the PRO subject of the resultative predicate in the *de*-TRC, as shown in (56b).

[8] It has been mentioned to me that (ib) is not acceptable (contra Huang 1992: 111).
(i) a. Akiu ba Baoyu ku de hen gan'ga.
Akiu BA Baoyu cry DE very embarrassed
'Akiu cried and as a result Baoyu got very embarrassed.'
b. ??Akiu ba Baoyu ku de hen shangxin.
Akiu BA Baoyu cry DE very sad
'Akiu cried and as a result Baoyu got sad.'
I have no account for the unnaturalness of (ib), compared to the grammatical (ia), as well as (54a).

(56) a. liang ge haizi haotaodaku.
two CL child cry.loudly
'The two children cried loudly.'
Not: 'There are two children, who cried loudly.'
b. Akiu da de liang ge haizi$_i$ PRO$_i$ haotaodaku.
Akiu beat DE two CL child cry.loudly
'Akiu beat the two children and as a result they cried loudly.'
Not: 'There are two children, whom Akiu beat and as a result they cried loudly.'

The affected argument in the *de*-IRC, however, can be nonspecific, as shown below. Thus the argument has a property of objects rather than subjects in this respect.

(57) a. Akiu xiao de liang hang yanlei gua zai le lian-shang.
Akiu laugh DE two line tear hang at PRF face-on
'Akiu laughed and as a result two lines of tears appeared on his face.'
b. Akiu han de xuduo ren fenfen likai le hui-chang.
Akiu shout DE many people one.after.another leave PRF meeting-hall
'Akiu shouted and as a result many people left the meeting hall.'

Third, unlike in an TRC, extraction out of an IRC is difficult, and the contrast patterns with the contrast between a control and an ECM structure in general. In the *de*-construction data in (58) and the V-V construction data in (59), topicalization and relativization of the internal argument of Vpri of TRC are possible; however, topicalization and relativization of the affected argument in IRC are not allowed.

(58) a. na shuang xie$_i$ Akiu chuan de t$_i$ dou po le. (*de*-TRC) (similar to 19)
that pair shoe Akiu wear DE even broken PRF
'That pair of shoes, Akiu wore and as a result they were broken.'
b. *na tiao shoujuan$_i$ Akiu ku de t$_i$ hen shi. (*de*-IRC)
that CL handkerchief Akiu cry DE very wet
c. Akiu chuan de t$_i$ dou po le de na shuang xie$_i$ (*de*-TRC)
Akiu wear DE even broken PRF MOD that pair shoe
'that pair of shoes that Akiu wore and as a result became broken.'
d. *Akiu ku DE t$_i$ hen shi de na tiao shoujuan (*de*-IRC)
Akiu cry DE very wet MOD that CL handkerchief
(59) a. Na shuang xie$_i$, Akiu chuan po le t$_i$. (V-V TRC) (similar to 20)
that pair shoe Akiu wear broken PRF
'That pair of shoes, Akiu wore and as a result they were broken.'
b. *na tiao shoujuan$_i$, Akiu ku shi le t$_i$. (V-V IRC)
that CL handkerchief Akiu cry wet PRF
c. Akiu chuan po le t$_i$ de na shuang xie (V-V TRC)
Akiu wear broken PRF MOD that pair shoe
'that pair of shoes that Akiu wore and as a result became broken'
d. *Akiu ku shi le t$_i$ de na tiao shoujuan (V-V IRC)
Akiu cry wet PRF MOD that CL handkerchief

In English, no such contrast is seen in a short-distance extraction:

(60) a. The joggers ran their Nikes threadbare.
b. Those Nikes, the joggers ran threadbare. (topicalization)
c. the Nikes that the joggers ran threadbare (relativization)
(61) a. John drank those people under the table.

b. Those people, John drank under the table. (topicalization)
c. the people whom John drank under the table (relativization)

However, the contrast is revealed in a long-distance extraction (Rothstein 1992, 2000b):

(62) a. Which table did you ask whether John wiped clean?
b. ??Which baby did you ask whether John sang asleep?

In (62a), the wh-nominal *which table* in the TRC moves out of the weak wh-island (the complement *whether*-clause), whereas in (62b), it is hard for the wh-nominal *which baby* in the IRC to undergo the similar movement.

The data in (63) show that in *tough*-constructions, extraction of an embedded object out of a control structure is easier than extraction of an embedded object out of an ECM structure (Chung 2001).

(63) a. ?Which book was John hard for us to persuade to read?
b. *Which book was John hard for us to expect to read?

The extraction data above indicate that it is easier to extract a nominal from a control structure than from an ECM structure. The extraction contrast introduced above between TRC and IRC may reflect the contrast between a control structure and ECM structure in general.

The two analyses, control and ECM, presented in Bowers (1993, 1997, 2000) and adopted in this paper, can capture the properties of the TRC and IRC. Specifically, in TRC the patient argument is the controller of the PRO subject of the resultative predicate. In IRC, however, there is no PRO, and the subject of the resultative predicate has a Case relation with the Vpri. The Case relation is similar to that between a transitive verb and its object. Thus the subject of the resultative in IRCs shows some, but not all, properties of objects. In Chinese, on the one hand, the subject of a resultative predicate in IRC can occur in the BA construction and can be nonspecific, as shown in (54a) and (57), respectively, exhibiting object properties. On the other hand, as shown in (41b), the subject of the resultative predicate can be preceded by some element in IRC, whereas a typical object cannot. This can be explained if the subject does not move overtly to the object position of the Vpri.

I conclude this subsection by claiming that in TRC, the subject of the resultative is a PRO, which can be viewed as a trace of a theta-to-theta movement (Hornstein 1999), whereas in IRC, the subject of the resultative is a regular overt nominal, not a PRO. However, the properties of both a control structure and an ECM-like structure indicate that the vP which hosts resultatives is a complement of Vpri, in both types of resultative constructions.

Based on the above four aspects, i.e., the position with respect to Vpri, the co-occurrence restriction, the hierarchy of depictives, and the control/ECM properties of resultative constructions, we conclude that the vP hosting secondary predicates are integrated into the structure of primary predication in two ways: as a complement of Vpri, or as an adjunct. The former case is found in resultative constructions, and the latter case is found in depictive constructions.

## 3.5 The locality of integration of a vP into the structure of primary predication

In both Chinese and English, the subject of a secondary predicate cannot be co-referential with the object of a preposition (Williams 1980: 204). For instance, the subject of the resultative predicate *full* is co-referential with the object of the Vpri, *wagon*, in (64a); however, the subject of *full* cannot be co-referential with *wagon*, which is the object of the

preposition *into*, in (64b). Similarly, the subject of the depictive predicate *green* cannot be co-referential with *hay*, which is the object of the preposition *with*, in (64d).

(64) a. John loaded the wagon full [with hay].
b. *John loaded the hay [into the wagon] full.
c. John loaded the hay [into the wagon] green.
d. *John loaded the wagon [with hay] green.

The same constraint is found in Chinese. In the reading of (65a), it is Akiu rather than Baoyu who was excited. In other words, the subject of the depictive predicate *xingfen* 'excited' is co-referential with the subject of Vpri, *Akiu*, rather than *Baoyu*, which is the object of the preposition *dui* 'to'. Similarly, the subject of the depictive predicate *rere* 'hot' is co-referential with the object of Vpri, *yi wan tang* 'one bowl of soup', rather than *chufang* 'kitchen', which is the object of the preposition *zai* 'at', in (65b). In (65c), the subject of the depictive predicate *ruanruan* 'soft' cannot be co-referential with *na tiao maojin* 'that towel', which is the object of the preposition *wei* 'for'. It can only be co-referential with the subject of Vpri, i.e., *Akiu*; however, semantically, a person cannot be predicated of by *ruanruan*, and thus the sentence is unacceptable. In the V-V construction (65d), the subject of the depictive predicate *nu* 'angry' is co-referential with *Akiu*, which is the subject of the Vpri *ma* 'scold', rather than *Baoyu*, which is the object of the preposition *miandui* 'toward'. The parralel resultative data are presented in (66). The subject of the resultative predicate *mei xinsi kan shu* 'have no mood to read books' cannot be co-referential with *Baoyu*, which is the object of the preposition *miandui* 'towards', in (66b). In the V-V construction (66c), the subject of the resultative predicate *ku* 'cry' is co-referential with *Daiyu*, which is the object of the Vpri *da* 'beat', rather than *Baoyu*, which is the object of the preposition *miandui* 'toward'.

(65) a. Akiu [dui Baoyu] xingfen de shuo le xuduo hua.
Akiu to Baoyu excited DE speak PRF many words
'Akiu said many words to Baoyu excited.'
b. Akiu [zai chufang li] rere de he le yi wan tang.
Akiu at kitchen in hot DE drink PRF one bowl soup
'Akiu drank a bowl of soup in the kitchen hot.'
c. *Akiu [wei na tiao maojin] ruanruan de zou-jin le yu-shi.
Akiu for that CL towel soft DE walk-enter PRF bath-room
d. Akiu [miandui Baoyu] nu ma Daiyu.
Akiu toward Baoyu angry scold Daiyu
'Akiu scolded Daiyu angry in front of Baoyu.'

(66) a. Akiu ku de mei xinsi kan shu le.
Akiu cry DE not.have mood read book PRT
'Akiu cried so that he had no mood to read books.'
b. Akiu [miandui Baoyu] ku de mei xinsi kan shu le.
Akiu towards Baoyu cry DE not.have mood read book PRT
'Akiu$_i$ cried in front of Baoyu$_j$ so that he$_{i/*j}$ had no mood to read books.'
c. Akiu [maindui Baoyu] da ku le Daiyu.
Akiu toward Baoyu beat cry PRF Daiyu
'Akiu beat Daiyu in front of Baoyu so that Daiyu cried.'

None of the subject-oriented depictive in (67a), the object-oriented depictive in (67b), and the resultative in (67c) can be co-referential with the possessor in the constructions.

(67) a. Akiu de erzi shangxin de jiang le yi ge gushi.
Akiu MOD son sad DE tell PRF one CL story
'Akiu's son told a story sad.' (It is not Akiu who was sad.)

b. Akiu huo zhuo le na zhi laohu de zaizi.
Akiu alive catch PRF that CL tiger MOD baby
'Akiu caught the baby of that tiger alive. (It is not the parent who was alive.)

c. Akiu da de na zhi laohu de zaizi liuxue le.
Akiu beat DE that CL tiger MOD baby bleed PRT
'Akiu beat the baby of that tiger so that it bled.' (It is not the parent who bled.)

Williams accounts for the English data like (64) by the C-command condition on his co-indexing operation of predication in general. The above data show that if the subject of a secondary predication is co-referential with a nominal of a primary predication, the nominal must be an argument of Vpri rather than any other nominal. The constraint indicates that the integration of a secondary predication into a primary one must be syntactically local. This locality constraint should follow the general principles of syntactic computations. In resultative constructions, we have argued that they have control (for TRCs) or ECM-like (for IRCs) structures. In the control structure, the general C-Command condition prohibits a PRO from being controlled by the object of a preposition, thus the impossibility for the subject of a resultative predicate to be co-referential with the object of a preposition is accounted for. Similarly, the general C-Command condition also prohibits a PRO from being controlled by a nominal internal to an argument nominal, thus the impossibility for the subject of a resultative predicate to be co-referential with the possessor of a nominal is also accounted for. In the ECM-like structure, the embedded subject has a Case relation with the verb, rather than a preposition or other nominal in the upper clause. Thus the impossibility for the subject of a resultative predicate to be co-referential with the object of a preposition or a possessor is also captured.

As for depictive constructions, we have assumed that they have control-to-adjunct structures. I then simply assume that whatever principle which rules out the impossible control in (68), rules out the impossible control in the depictive constructions in (65) and (67).[9]

(68) a. John arrested $Bill_i$ behind $Tim_j$ [for $PRO_{i/*j}$ driving his car too fast]
b. John arrested $Bill'_j$s $brother_i$ [for $PRO_{i/*j}$ driving his car too fast]

Depictive constructions thus differ from parasitic gap (pg) constructions. On the one hand, pgs, by definition, require real gaps to "license" them, whereas the null subject of depictives does not. In other words, the controller of the PRO subject of a depictive does not need to undergo any movement. On the other hand, pgs can be related to a real gap which is

[9] One might assume that the null subject of a depictive predicate is the trace of a sideward theta-to-theta movement from an adjunct vP to an argument position of the primary predication, adopting Nunes & Uriagereka (2000) and Hornstein (2001). In the depictive constructions in (65), if the null subject of the depictive predicate were co-referential with the object of the preposition, the assumed sideward movement would land at a position internal to a PP. Nunes and Uriagereka (2000: 38) claim that "sideward movement from a derivational workspace $W_1$ to a derivational workspace $W_2$ yields licit result just in case $W_1$ will be embedded in $W_2$ at some derivational step." In the licit derivations of depictive constructions, the sideward movement of a nominal lands at an argument position of the verbal projection of the primary predication, and the vP where the sideward movement starts is finally embedded to the verbal projection. In data like (65), the adjunct PP itself is an independent derivational workspace. If a sideward movement lands at a position internal to the PP, obviously, the vP where the sideward movement starts is never embedded to the PP. Thus such a derivation is not licit. Consequently, co-reference of the subject of a depictive predicate with an object of a preposition is impossible.

However, this embedded-to-embedding-account has both empirical and theoretical problems. Empirically, it cannot cover the parasitic data like (69), where an assumed sideward movement lands internal to a PP. Theoretically, this embedded-to-embedding-account is not a local consideration. To judge the possibility of a certain step derivation one needs to check the future steps of the derivation.

an object of a preposition, as shown in (69) (Hornstein 2001: 114) and (70a) (Hornstein 2001: 79, 123), whereas the null subject of a depictive cannot co-referential with an object of a preposition, as shown above.

(69) a. Who did you show the book [to t] before Fred introduced pg.
b. Who did you talk to me [about t] right after Fred introduced pg.
(70) a. This is a topic that you should think about t before talking about pg.
b. *This is a topic about which you should think t before talking pg.

In this section, I have studied the syntactic properties of depictive and resultative predicates, arguing that the former are hosted by an adjunct vP, while the latter are hosted by a complement vP. The ways in which they are integrated into the structure of primary predication follow the general principles governing computations of complements and adjuncts.

# 4 The surface position of the element realizing of v in secondary predication

In this section we discuss the surface position of an overt element at v, i.e., *de* or the secondary predicate in the V-V construction. I will make the following claims. The surface position of *de* is decided at PF. In the V-V construction, the lexical head of a depictive predicate first raises to v (8b) and then left-adjoins to Vpri at PF, while the lexical head of a resultative predicate undergoes successive head raising in syntax.

## 4.1 The V-V Constructions

In the depictive V-V construction, the depictive predicate is left-adjacent to Vpri, while in the resultative V-V construction, the resultative predicate is right-adjacent to Vpri. This is shown in the possible positions of adverbs such as *like* 'immediately' and *yijing* 'already' in (71):

(71) a. Akiu (like) sheng (*like) chi le na tiao yu.
Akiu immediately raw immediately eat PRF that CL fish
'Akiu (immediately) ate that fish raw.'
b. Akiu (yijing) da (*yijing) ku le Baoyu.
Akiu already beat already cry PRF Baoyu
'Akiu (already) beat Baoyu so that Baoyu cried.'

In (71a), the depictive predicate *sheng* 'raw' is immediately left-adjacent to the Vpri *chi* 'eat'. In (71b), the resultative predicate verb *ku* 'cry' is immediately right-adjacent to the Vpri *da* 'beat'. In neither case can the adverb occur between the Vpri and the secondary predicate.

Although both types of secondary predicates are adjacent to Vpri, the depictive sequence of [V-Vpri-Asp] is opaque to syntactic operations, while the resultative sequence of [Vpri-V-Asp] is not. This can be shown by the so-called A-not-A formation, a yes-no question formation in Chinese. In this operation, a yes-no [Q] feature is integrated into a verb, deriving a form where the verb is reduplicated, and an appropriate form of the negation word occurs between the two copies of the verb, as shown in (72b).

(72) a. Akiu chi le na tiao yu.
Akiu eat PRF that CL fish
'Akiu ate that fish.'

b. Akiu chi mei chi na tiao yu?
Akiu eat not eat that CL fish
'Did Akiu eat that fish?'

This A-not-A formation can be applied to the resultative sequence [Vpri-V-Asp], but not the depictive sequence [V-Vpri-Asp], as shown in the contrast between the depictive constructions in (73) and the resultative constructions in (74):

(73) a. Akiu sheng chi le na tiao yu.
Akiu raw eat PRF that CL fish
'Akiu ate that fish raw.'

b. *Akiu sheng (chi) mei sheng chi na tiao yu?
Akiu raw eat not raw eat that CL fish

b'. *Akiu sheng chi-mei-chi na tiao yu?
Akiu raw eat-not-eat that CL fish

c. *Akiu huo (zhuo) mei huo zhuo na tiao yu?
Akiu alive catch not alive catch that CL fish

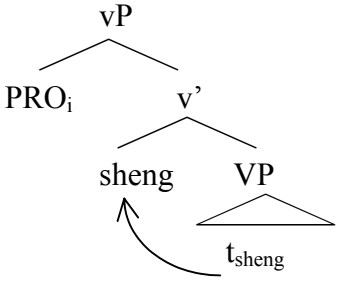
d. *Akiu nu (ma) mei nu ma Baoyu?
Akiu angry scold not angry scold Baoyu

(74) a. Akiu da po le na ge huaping.
Akiu beat broken PRF that CL vase
'Akiu beat that vase broken.'

b. Akiu da (po) mei da po na ge huaping?
Akiu beat broken not beat broken that CL vase
'Did Akiu break that vase?'

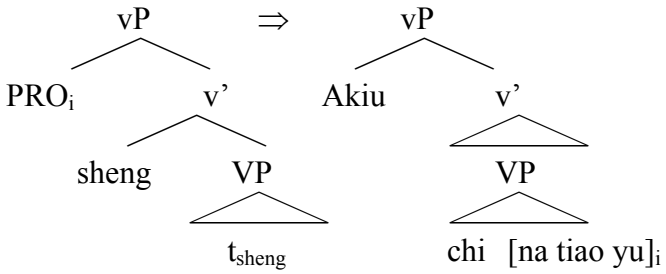
One account for this contrast is that the depictive sequence [V-Vpri-Asp] is derived at PF, and thus there is no way to go back to syntax to integrate a [Q] feature into this sequence. The theoretical presupposition here is that any element which has been targeted by a phonological operation cannot undergo a subsequent syntactic operation. It is generally assumed that Chinese verbs overtly adjoin to the head of AspP in syntax to derive the verb-asp sequence. I propose that depictive predicate verbs PF-adjoin to the left of the Vpri after the Vpri has moved to Asp. By the proposed PF movement, the depictive predicate verb left-adjoins to the sequence [Vpri-Asp], and thus a new sequence of [V-Vpri-Asp] is derived. In (73a), for instance, the lexical head *sheng* 'raw' of the depictive predicate moves from a VP to the head of a vP in syntax (8b) (step ① in (75)), and the vP merges with the primary predicate as an adjunct (I use ⇒ to show this adjunction integration in step ② in (75)). The exact adjunction place is irrelevant here. On the other hand, in the structure of the primary predicate, *chi* 'eat' adjoins to the perfect aspect *le* in syntax, deriving [chi-le] at Asp (step ③ in (75)). Then at PF *sheng* moves from v to [chi-le], deriving [sheng-chi-le] (step ④ in (75)).

(75) step ① head-raising in vP

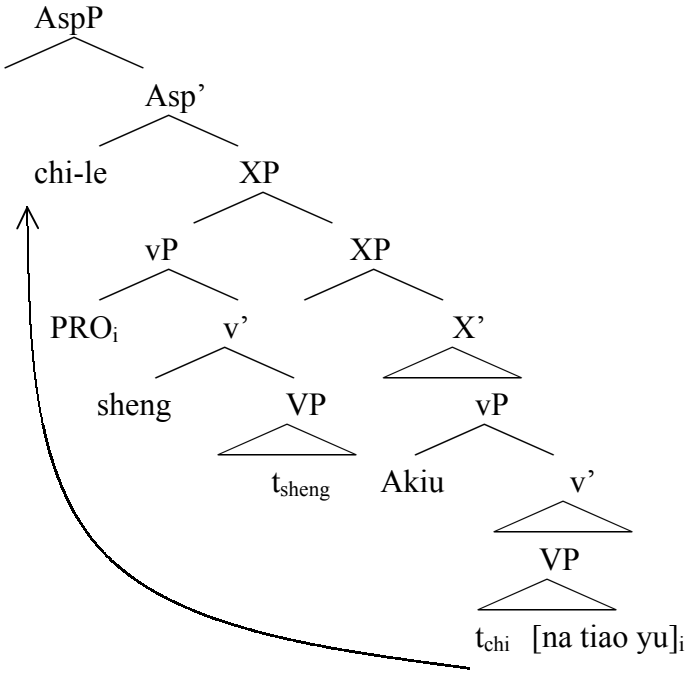



Akiu sheng chi le na tiao yu (73a)
Akiu raw eat PRF that CL fish
'Akiu ate that fish raw.'

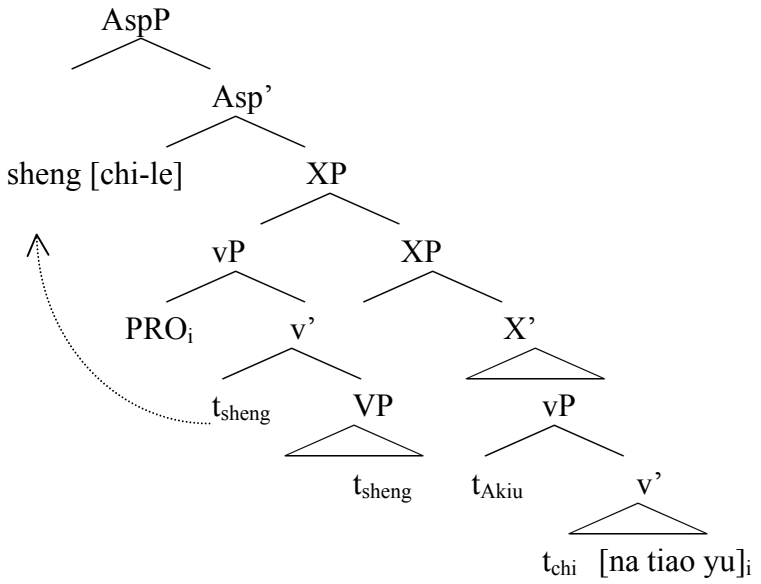
step ② adjunction




step ③ head-raising to Asp



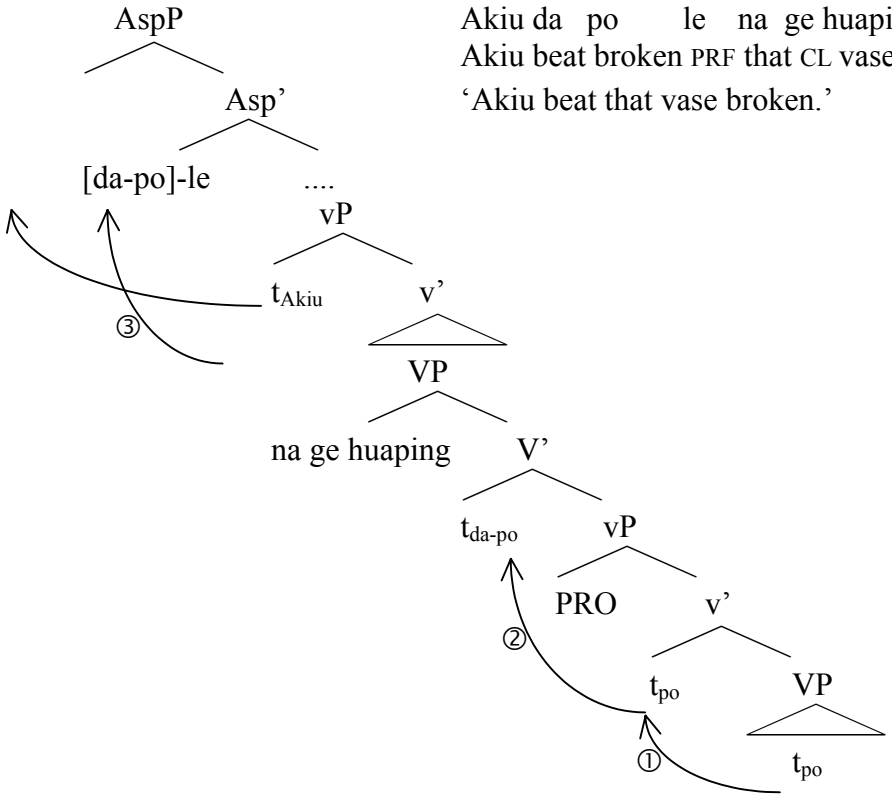

step ④ PF-raising




In this derivation, after *sheng* is combined with [*chi-le*] at PF, the derived form *sheng-chi-le* is opaque to any syntactic operation such as the integration of [Q] to derive an A-not-A form. Thus data like (73b-d) are underivable, as desired. In addition, being a PF operation, the raising of *sheng* from an adjunct in step ④ is not ruled out by CED.

The resultative V-V construction, in contrast, does not involve any such PF operation. I illustrate the derivation of (74a) in (76). I assume that in this construction, after the resultative predicate verb *po* 'broken' raises to v (8b) (step ①), the verb moves further to the right of the Vpri *da* 'beat', which selects the vP (step ②).[10] Then the newly formed [da-po] raises to Asp, deriving the sequence of [da-po-le] (step ③).

(76)




Akiu da po le na ge huaping. (74a)
Akiu beat broken PRF that CL vase
'Akiu beat that vase broken.'

Since these three instances of head raising all occur in syntax, a further syntactic operation such as the integration of [Q] is possible. Thus this analysis captures the grammaticality of (74b).

## 4.2 The DE Constructions

In the depictive *de* construction, *de* is right-adjacent to the depictive predicate. This is shown in (77a), where the possible positions of the adverb like 'immediately' illustrate the adjacency.

(77) a. Akiu (like) gaoxing (*like) de (like) na le yi zhang tanzi.
A. immediately happy immediately DE immediately take PRF one CL carpet
'Akiu (immediately) took a carpet happy.'

b. Akiu hen gaoxing de ruanruan de zai di-shang pu le yi zhang tanzi.
Akiu very happy DE soft DE at floor-on spread PRF one CL carpet
'Akiu spread a carpet on the floor soft happy.'

In (77a), *de* occurs to the immediate right of the depictive predicate *gaoxing* 'happy'. In (77b), there are two depictive predicates. Each occurrence of *de* surfaces to the right of each depictive predicate, *hen gaoxing* 'very happy' and *ruanruan* 'soft'. Data like (77) tell us that *de*, which is base-generated at v, surfaces to the immediate right of a depictive predicate.

[10] Kayne's (1994) constraint that heads can only left-adjoin to other heads is violated in this case. Other cases of similar violation can be found in the literature (cf. Roberts 2000). I leave this issue for future research.

We have assumed that depictive predicates are complement of v (8a). In addition, we also assume that a complement is to the right of its selecting head (Kayne 1994). Thus the base-order of a depictive predicate in the *de* construction should be [de-X], where X is the depictive predicate. The surface order in (77), however, is [X-de].

In the resultative *de* construction, *de* is right-adjacent to Vpri. This is shown in (78), where the possible positions of the adverb *yijing* 'already' illustrate the adjacency.

(78) Akiu (yijing) ku (*yijing) de liang tiao shoujuan dou shi le.
Akiu already cry already DE two CL handkerchief even wet PRT
'A. (already) cried so much that two handkerchieves were wet.'

In (78), *de* is immediately right-adjacent to the Vpri *ku* 'cry', and no adverb can occur between the Vpri and *de*.

The *de*-cluster in both the depictive and the resultative construction fails to form an A-not-A form:[11]

(79) a. Akiu rere de he le na bei cha.
Akiu hot DE drink PRF that cup tea
'Akiu drank that cup of tea hot.'
b. *Akiu rere de {mei/bu} rere de he (le) na bei cha?
Akiu hot DE not/not hot DE drink PRF that cup tea
c. *Akiu rere de he {mei/bu} he na bei cha?

(80) a. Akiu da de Baoyu haotaodaku.
Akiu beat DE Baoyu cry.loudly
'Akiu beat Baoyu and as a result Baoyu cried loudly.'
b. *Akiu da de {mei/bu} da de Baoyu haotaodaku?
Akiu beat DE not/not beat DE Baoyu cry.loudly
c. *Akiu da {mei/bu} da de Baoyu haotaodaku?

The impossibility of the *de*-clusters to have an A-not-A form suggests that they have undergone some PF operation and thus are opaque to the syntactic integration of [Q].

In addition, the Vpri in the depictive *de* construction can have an aspect suffix, as shown by the presence of *le* in (79a), whereas the Vpri in the resultative *de* construction cannot have an aspect suffix:

(81) Akiu da (*le) de (*le) Baoyu haotaodaku.
Akiu beat PRF DE PRF Baoyu cry.loudly
'Akiu beat Baoyu and as a result Baoyu cried loudly.'

If the *de*-clusters are formed in PF, this aspect contrast can be accounted for. Specifically, I propose that *de* surfaces to the immediate right of the leftmost verbal lexical element of the construction, by a PF movement. The leftmost verbal lexical element is the Vpri in resultative constructions, whereas it is the depictive in depictive constructions. In (79a), for instance, the leftmost verbal element is *rere* 'hot', and thus *de* attaches to the right of *rere*. If so, after the PF movement, the opaqueness of the *de*-clusters to any syntactic

[11] One might argue that (79b) is not acceptable because *rere* 'hot' is not a typical verb and thus cannot have an A-not-A form. However, elements which do not look like typical verbs can have an A-not-A form. The preposition *cong* 'from' in (i) and the adjective-like word *piaoliang* 'pretty' in (ii) are both in A-not-A form:

(i) ta cong-mei-cong Shanghai lai?
s/he from-not-from Shanghai come
'Did s/he come from Shanghai?'

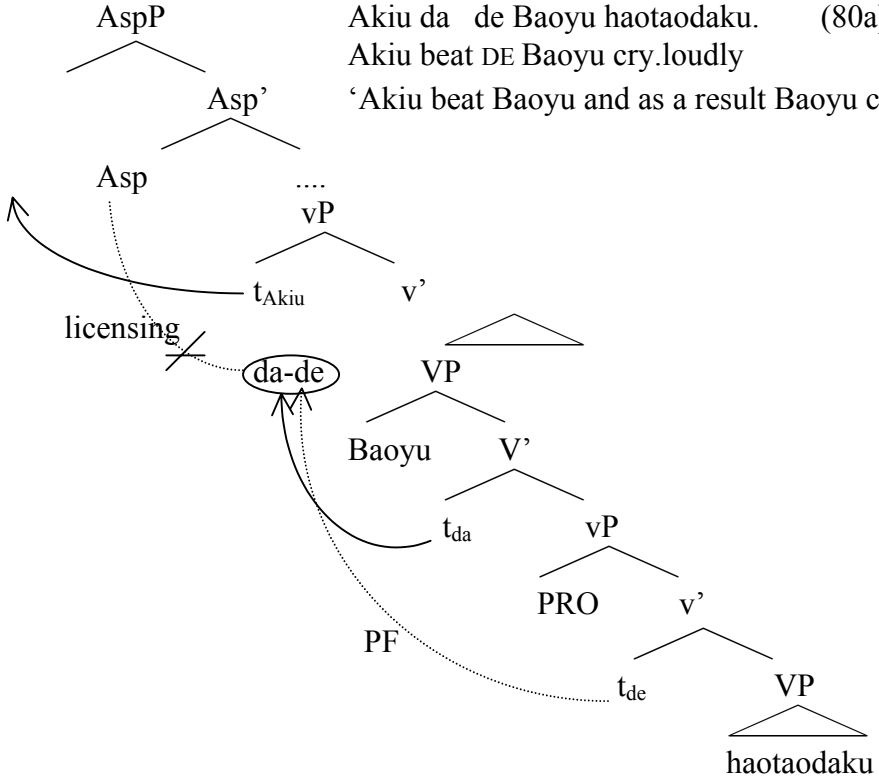
(ii) ta zhang de piaoliang-bu-piaoliang?
s/he grow DE beautiful-not-beautiful
'Is s/he beautiful?'

operations such as the integration with [Q] to form an A-not-A form in (79) and (80) and raising of Vpri to Asp (81) is expected.

On the other hand, in the depictive construction, *de* attaches to the depictive predicate, rather than the Vpri, thus Vpri is free to undergo the syntactic movement to Asp. In contrast, in the resultative construction, *de* attaches to Vpri, making the latter unable to undergo the syntactic movement to Asp.[12]

In this research I adopt Chomsky's (1998, 1999) proposal that structure is sent to PF at discrete junctures in the derivation, called "phases." Chomsky argues that CP and vP are such phases. In resultative constructions, the vP which hosts the resultative is firstly merged with Vpri. Then in a certain step of the syntactic computations, Vpri moves to the left of its object, deriving the VO order, before a higher vP is built. After the derivation reaches to the level of the higher vP, a phase is completed. Then the vP is sent to PF. In PF, *de* moves from the lower v to the right of the leftmost verbal element, i.e., Vpri. Assume that AspP is projected higher than vP. After the Vpri is targeted by the PF operation, there cannot be any aspect licensing relation between the Vpri and Asp in syntax any more (81). Nor can the Vpri merge with [Q] (80). The derivations of (80a) are illustrated in (82):

(82)




Akiu da de Baoyu haotaodaku. (80a)
Akiu beat DE Baoyu cry.loudly
'Akiu beat Baoyu and as a result Baoyu cried loudly.'

In contrast to the derivations in (82), if there is no PF-operation, the element in v is at the "edge" of the vP phase, so it may raise to Asp in the CP-phase. This is exactly what we see in the V-V resultative construction, where the sequence of V-V-asp occurs.

[12] It has been suggested to me that a verb cannot have two suffixes in Chinese, and thus the constraint that Vpri does not have an aspect suffix in the *de* resultative construction should be covered. However, data like (i) show that a verb can have two suffixes, and thus the number of suffixes cannot account for the constraint:

(i) Akiu chi guo le fan jiu shuijiao le.
Akiu eat EXP PRF meal then sleep PRF
'After Akiu had eaten the meal, he slept.'

In this section, I have argued that *de* attaches to the right of the leftmost verbal lexical element at PF. I have also argued that in the V-V construction, a depictive predicate PF-adjoins to Vpri, whereas a resultative predicate undergoes a successive head-raising in syntax.

# 5 The effect of head movement in resultative constructions

The assumed successive head raising of the resultative predicate in the V-V resultative construction, and the absence of the raising in the *de* resultative construction, explain the contrasts in the orientation of the resultative predicates and the specificity of the subject of the resultative predicates of the two constructions.

## 5.1 The orientation of resultative predicates

One contrast between the V-V and the *de* construction is that if the Vpri is not a subject-control verb (see section 3.4.2), in the presence of an overt object of the Vpri, the V-V construction allows a subject-orientation reading, as noted by Li (1990), while the *de*-construction does not, as shown in (83) and (84):[13]

(83) a. Baoyu zhui lei le Daiyu.
Baoyu chase tired PRF Daiyu
'Baoyu chased Daiyu and as a result Daiyu got tired.'
'Baoyu chased Daiyu and as a result Baoyu got tired.'

b. Baoyu zhui de Daiyu qichuanxuxu.
Baoyu chase DE Daiyu gasp
'Baoyu chased Daiyu and as a result Daiyu gasped.'

(84) a. Baoyu kan ni le na pan luxiang.
Baoyu watch fed.up PRF that CL video
'Baoyu watched that video and as a result he got fed up with it.'

b. *Baoyu kan de na pan luxiang dou ni le.
Baoyu watch DE that CL video even fed.up PRF

In the V-V construction (83a), the subject of the resultative predicate is co-referential with either the subject or the object of Vpri, i.e., either Baoyu or Daiyu got tired. However, in the *de* construction (83b), the subject of the resultative predicate can only be co-referential with the object of Vpri, i.e., only Daiyu gasped, not Baoyu. In the V-V construction (84a), the subject of the resultative predicate is co-referential with the subject of Vpri, i.e., Baoyu got fed up. It cannot be co-referential with the object of Vpri, since semantically, *na pan luxiang* 'that video' cannot the subject of the predicate *ni* 'get fed up'. In the *de* construction (84b), the subject of the resultative predicate cannot co-referential with the subject of Vpri. It can only be co-referential with the object of Vpri. However, since the semantic clash mentioned above rules out the co-indexing, the secondary predication fails and the sentence is unacceptable.

We have argued in section 3.4.2 that TRCs have a control structure. The control of the PRO subject of the resultative predicate by the subject of Vpri seems to violate MDP, since the nearest overt c-commanding nominal is the object of Vpri, rather than the subject of Vpri. Why is this violation allowed in the V-V construction, but not in the *de* construction?[14]

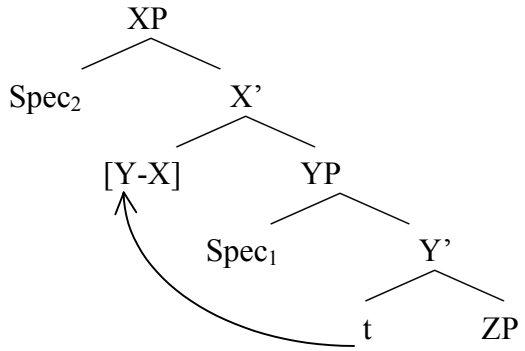
[13] The subject of the primary predicate of (83) can also be a theme causer. In that case, it patterns with (15), and the reading of the sentence is 'Chasing Baoyu, Daiyu got tired.' See the discussion of (15) in section 2.1.

[14] It has been mentioned to me that Igbo also has the V-V resultative construction, however, we have not seen any subject-oriented reading in the language. It is unclear to me whether Igbo really does not allow a subject-orientated reading or simply we do not have such data available. In all the Igbo data in Dechaine (1993), such a reading is semantically or pragmatically ruled out. In any case, I leave this issue for future research.

In Huang's (1992: 130) approach, the V-V construction is derived by a reanalysis of the complex predicate V' into $V^0$, and the raising of the entire compound. He claims that the essential difference between the V-V construction and the *de*-construction is that "whereas the former is a lexical category, the latter is a phrase" (p. 126). Consequently, the reading contrast like that between the a-sentences and the b-sentences in (83) and (84) is simply acknowledged by the claim that "the internal structures of compounds are not accessible to rules or principles that apply in syntax, in particular the MDP" (p. 127). Since in my approach, the V-V construction is derived in syntax, an alternative account for the contrast is called for.

I have argued that a successive head-raising occurs in the V-V TRC, but not in the *de*-TRC. Consider the structure (85), where t is the trace of Y, which is adjoined to X to form [Y-X].

(85)




Chomsky (1993, 1995: 298) claims that in this structure $Spec_1$ and $Spec_2$ are both in the minimal domain of the chain Y-t and are therefore equidistant from $\alpha$, which is either ZP or a nominal within ZP. Move can therefore raise $\alpha$ to target either $Spec_1$ or $Spec_2$, which are equally close to $\alpha$. It is reasonable to extend the application of this notion of equidistance from movement to control (in Hornstein 1999, 2001 control is analyzed as an operation of theta-to-theta movement). Accordingly, let us assume that in the V-V TRC, the successive head raising makes the subject of the Vpri and the object of the Vpri equidistant from the PRO subject of the resultative. In contrast, in the *de*-TRC, no corresponding successive head raising occurs in syntax, and thus compared to the subject of the Vpri, the object of the Vpri is always closer to the PRO subject of the resultative. Although some technical details need to be worked out, it is reasonable to claim that head raising in syntax may allow some control cases to escape from the constraint of MDP.

## 5.2 The specificity of the subject of resultative predicates

Another contrast between the *de* and the V-V TRC is that the subject of the resultative predicate in the former cannot be nonspecific, like a regular subject in Chinese generally, whereas the subject of the resultative predicate in the latter can. The contrast is shown in (86):

(86) a. Akiu da de {na/*yi} ge xiaohair haotaodaku.
Akiu beat DE that/one CL child cry.loudly
'Akiu beat that child and as a result the child cried loudly.'

b. Akiu da ku le yi ge xiaohair.
Akiu beat cry PRF one CL child
'Akiu beat a child and as a result the child cried loudly.'

Tsai (2001) argues that head-raising out of the projection where a subject is base-generated can license a non-specific reading of the subject. In the above discussion we have claimed that in the V-V resultative construction, the resultative predicate first raises from VP to the lower v, it then raises from the lower vP to Vpri, and finally the derived [Vpri-V] raises

to Asp (passing the higher v). In the second step of the head chain, the resultative predicate moves out of the vP where the subject of the predicate, a PRO, is base-generated. If Tsai's basic thesis is right, a nonspecific reading of the subject of the resultative predicate in this case is licensed. In contrast, in the *de* resultative construction, the resultative predicate never moves out of the lower vP, where its subject, a PRO, is base-generated, and thus no nonspecific reading of the subject is licensed in TRC (however the Case relation of the subject of a resultative with the Vpri makes possible the nonspecific reading of the subject in IRC. See section 3.4.3).

In this section I have argued that in the V-V TRC, the successive head-raising may account for the possible subject-oriented reading of the resultative predicate, and the head raising out of the lower vP can account for the possible non-specific reading of the subject of the secondary predicate.

## 6 Conclusions and remaining issues

I have argued for the projection of vP in secondary predication. In secondary predication, v is overtly realized in Chinese by Merge (insertion of the functional word *de*) or Move (attraction of the lexical head of a secondary predicate). The former option derives the *de*-construction, whereas the latter option derives the V-V construction. I have also presented the asymmetry between vP as a complement of Vpri and vP as an adjunct of the structure of the primary predication. Specifically, resultatives are hosted by complement vPs, whereas depictives are hosted by adjunct vPs. This complement-adjunct asymmetry accounts for a series of syntactic properties of secondary predication in Chinese: the position of a secondary predicate with respect to Vpri, the co-occurrence patterns of secondary predicates, the hierarchy of depictives, the control and ECM properties of resultative constructions, and the locality constraint on the integration of secondary predicates into the structure of primary predication.

In addition, I also argued that the surface position of *de* is derived by a PF operation which attaches *de* to the right of the leftmost verbal lexical head of the construction, and that in the V-V TRC, the successive head-raising may account for the possible subject-oriented reading of the resultative predicate, and that the head raising out of the lower vP accounts for the possible non-specific reading of the subject of the resultative predicate.

In this paper we have analyzed two properties of Chinese secondary predicate constructions which are not found in English: the alternation of the *de* and the V-V constructions, and the possible subject-oriented reading of resultatives under a certain syntactic condition, i.e. in the V-V construction. There is a third difference between the two languages which has not been noted in the literature: the occurrence of an overt subject of a secondary predicate in the presence of both subject and object of Vpri:

(87) a. na zhi laohu <u>xue</u> linlin de chi le yi kuai rou. (depictive)
that CL tiger blood drip DE eat PRF one chunk meat
'That tiger ate a chunk of meat with dripping blood.'

b. Baoyu$_i$ [t$_i$ da de Daiyu [<u>shou</u> dou teng le]]. (resultative)[15]
Baoyu beat DE Daiyu hand also painful PRT
'Baoyu beat Daiyu so that his$_{Baoyu}$ own hand was painful.'

[15] I thank Zo Xiu-Zhi Wu for helping me with the Chinese example (87b). Korean data similar to (87) can be found in Kim & Maling (1997).

In (87a), *xue* 'blood' is the subject of the depictive *linlin* 'drip', and it has a theta relation with the depictive, rather than with the Vpri *chi* 'eat', which has both the overt subject *Akiu* and the overt object *yi kuai rou* 'one chunk meat'. Similarly in (87b) there is no argument sharing between the overt two arguments of the Vpri and the overt subject of the resultative predicate. In this sentence, *shou* 'hand' is the subject of the resultative *teng* 'painful', and it is co-referential with neither of the two overt arguments of the Vpri *da* 'beat', *Baoyu* and *Daiyu*. Unlike the English sentence in (88), there is no intonation break between the part which denotes the secondary predication and the rest of the sentence. Thus data like (87) look like regular secondary predication constructions.

(88) John left, his ears red.

Data like (87), however, have two constraints. First, the overt subject of the secondary predicate must have a part-whole relation with an argument of the Vpri. In (87a), *xue* 'blood' is the subject of the depictive *linlin* 'drip', and it has a part-whole relation with the object of the Vpri, *yi kuai rou* 'one chunk meat'. (89a) is not acceptable, because there is no part-whole relation between the overt subject of the depictive, *tian* 'sky', and any argument of the Vpri. In (87b), the subject of Vpri, *Baoyu*, is an inalienable possessor of *shou* 'hand', which is the subject of the secondary predicate *teng* 'painful'. (89b) is unacceptable because no such relation occurs between the subject of the secondary predicate, *caidao* 'knife', and any argument of the Vpri.

(89) a. *na zhi laohu tian hei de chi le yi kuai rou.
that CL tiger sky dark DE eat PRF one CL meat
b. *Akiu qie de rou caidao dou dun le.
Akiu cut DE meat knife even blunt PRF

The second constraint is that between the two nominals which have a part-whole relation, the overt argument of Vpri and the overt subject of a secondary predicate, it is always the case that the former is an inalienable possessor of the latter. This relation cannot be reversed. These two constraints suggest that a kind of possessor-raising may occur in such data from the vP which hosts the secondary predicate to the structure of primary predication, or that a kind of possessee-possessor dependency construal occurs between an argument of vP which hosts the secondary predicate and an argument of Vpri. Such data may reveal the extent of grammatical argument-sharing, which has been claimed to be a defining property of depictive (Rothstein 2000a). I leave this for future research.

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