

# THE THEORY OF X-BINDING AND SOME ASPECTS OF SCRAMBLING IN POLISH

JACEK WITKOŚ

*Adam Mickiewicz University, Poznań*

## *1. Introduction.*

The aim of this paper is to present certain aspects of scrambling and Wh-movement in Polish in the light of the theory of X-binding presented by Joseph Aoun and the analysis of empty categories conducted by Denis Bouchard. In the first part of the paper an outline of the theory of A-binding will be presented and followed by its modified versions suggested by Aoun and Bouchard respectively. Then Wh-movement and topicalisation/scrambling in Polish will be interpreted in the framework of the X-binding theory. Special attention will be devoted to *żeby*-complement clauses and leftward movement from the subject position, frequent in scrambling in Polish.

## *2. The GB account of A-binding.*

The GB account of anaphoric binding concerns only A-binding, a relation holding between two nominal elements placed (base derived or moved) in argument positions. Chomsky classified all NPs into three categories: anaphors, pronominals and names and each of them was described by one binding principle accordingly:

- (1) A. An anaphor must be bound in its governing category if it has one.  
B. A pronominal must be free in its governing category if it has one.  
C. A name must be free everywhere.

The crucial term binding is defined as follows:

- (2)  $\alpha$  binds  $\beta$  if and only if:
  - a.  $\alpha$  c-commands  $\beta$
  - b.  $\alpha$  and  $\beta$  are coindexed.

Chomsky defines c-command in the following way:

- (3)  $\alpha$  c-commands  $\beta$  if  $\alpha$  does not dominate  $\beta$  and every  $\gamma$  that dominates  $\alpha$  dominates  $\beta$ .  
(Chomsky, 1986)

Where  $\gamma$  is restricted to maximal projections (as Aoun and Sportiche, 1983, suggest) the above relation is referred to as m-command. Of government, Chomsky gives the following definition:

- (4)  $\alpha$  governs  $\beta$  if  $\alpha$  m-commands  $\beta$  and there is no  $\gamma$ ,  $\gamma$  a barrier for  $\beta$ , such that  $\gamma$  excludes  $\alpha$ .  
(Chomsky, 1986)

In the core case of government a lexical head governs its complements. Now we can proceed to defining the governing category:

- (5)  $\beta$  is a governing category for  $\alpha$  if and only if:
- $\beta$  is the minimal category containing  $\alpha$ , a governor of  $\alpha$  and a SUBJECT accessible to  $\alpha$
  - $\beta$  is the root sentence if not a. and  $\alpha$  is governed. (Chomsky, 1981)

SUBJECT is the most prominent nominal element within a sentence. The elements in italics below are SUBJECTS:

- (6) John past *AGR* win.  
(7) he wants very much [for *John* to win]  
(8) he believes [*John* to be interesting]  
(9) [*John's* reading a book] surprised me

The AGR element of the INFL phrase is coindexed with the NP it governs and this coindexation expresses the phenomenon of subject-verb agreement. Although AGR creates a governing category in which an anaphor must be bound, the AGR itself is not a binder. Otherwise (10) would be grammatical with the reciprocal pronoun bound by AGR:

- (10) \* each other AGR win

and (11) would obviously constitute a Principle C violation:

- (11) \* John AGR be sick

Accessibility of the SUBJECT is defined in terms of the i-within-i condition:

- (12) a. \* [ $\gamma_i \dots \delta_i \dots$ ]  
where  $\gamma$  and  $\delta$  bear the same index
- b.  $\alpha$  is accessible to  $\beta$  if  $\beta$  is in the c-command of  $\alpha$  and coindexation of  $\alpha$  and  $\beta$  does not violate a.<sup>1</sup>

<sup>1</sup> The i-within-i condition holds in a variety of constructions such as:

- (a) \* [ the friends of [ each other ] ]  
NP<sub>i</sub> NP<sub>i</sub>
- (b) \* there is [ a picture of [ itself ] ] on the mantelpiece  
NP<sub>i</sub> NP<sub>i</sub>

Thus within S(IP) the nominative subject of a clause is a governing category within which anaphors must be bound.

With NPs the situation is different; in English an NP is a governing category when it contains a SUBJECT:<sup>2</sup>

- (13) John admired [ *Mary's*<sub>2</sub> picture of herself<sub>2</sub> ]  
NP

In (13) the reflexive pronoun is bound within the NP by its SUBJECT *Mary* and clearly cannot be coindexed with another potential binder *John*. The latter however becomes a proper binder of a reflexive pronoun within an NP if this NP has no accessible SUBJECT as (14):

- (14) John<sub>2</sub> admired [ this picture of himself<sub>2</sub> ]  
NP

The choice of a governing category depending on the presence of an accessible SUBJECT is exemplified by (15):

- (c) \* [ the owner of [ [ his ] boat ] ]  
NP<sub>i</sub> NP<sub>i</sub>
- (d) \* [ the friends of [ [ their ] parents ] ]  
NP<sub>i</sub> NP<sub>i</sub>

<sup>2</sup> Aoun analyses NP as a governing category in detail. In French the specifier of an NP is in an  $\bar{A}$ - not A-position (like in English). The internal structure of NP in French is: as follows:

- the subject of an NP and the prenominal position are coindexed.
- the prenominal position is an  $\bar{A}$ -position.
- the specifier is the most prominent element (SUBJECT) of an NP.

Extraction of a Wh subject from the NP is possible because the subject is coindexed with the prenominal  $\bar{A}$ -position. But extraction of a non-subject element from the NP is ungrammatical. In English, unlike in French, an NP counts as a governing category for a reciprocal only when the prenominal A-position is filled by a lexical element:

- they<sub>i</sub> like [ his picture of each other<sub>i</sub> ]  
NP
- they<sub>i</sub> like [ the pictures of each other<sub>i</sub> ]  
NP

In English it is the A-position of a Specifier that counts as SUBJECT. In French the counterpart of b. is predicted as ungrammatical. It seems that in Polish NP has no SUBJECT position at all. Consider:

- Marek<sub>i</sub> obejrzał [ jej<sub>j</sub> film o sobie<sub>i,j</sub> ]  
NP
- Marek<sub>i</sub> obejrzał [ film o sobie<sub>i</sub> ]  
NP



- (15) [we thought [ that [ pictures of each other] AGR<sup>3</sup> would be on sale]]]  
           S                  S          NP

In (15) the embedded AGR is not accessible to the anaphor because of a violation of i-within-i but the matrix AGR is and the anaphor is bound in the matrix S (IP). Similarly (16) is unacceptable because the pronominal is bound in its governing category, the matrix S (IP):

- (16) \* [John<sub>2</sub> AGR saw [ a picture of him<sub>2</sub>]]  
           S                                  NP

A possible lack of an accessible SUBJECT has led to the modification of the definition of the governing category for governed elements lacking SUBJECT. In such cases the root sentence becomes the governing category. This modification precludes (17) as a structure in which an anaphor is not bound:

- (17) \* [ for each other to win] would be unfortunate.  
           NP

Binding Principle A covers not only lexical anaphors but non-lexical anaphors (NP traces) as well. NP-movement is clearly a process of moving an NP from one A-position to another A-position. For NP-movement to take place several conditions must be met: there must be an available empty landing site in an A-position, the movement must obey locality conditions (mainly Subjacency), the moved NP must leave a trace and the trace and the moved element must form a proper chain. Properties of such a chain must derive from the Theta-theory and Case theory: the trace remains in a Theta-marked position and the head of the chain is in a position where it can receive Case. Well formedness conditions of the Theta-theory and Case theory linked to each other by means of the Visibility constitute the motive for NP-movement.

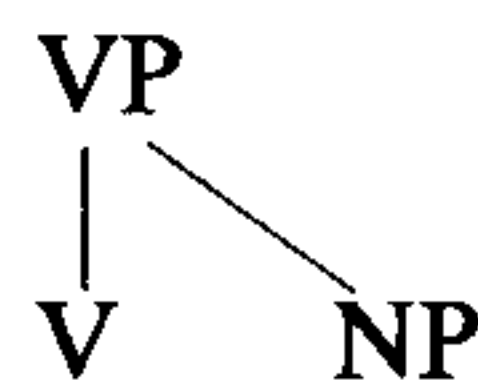
Another type of syntactic movement, Wh-movement, is not embraced by binding principle A, on the contrary its trace (referred to as variable) is treated on a par with names in that it must obey Principle C. Besides antecedents of the Wh-trace occur in  $\bar{A}$ -positions, mainly in Comp.

## 2. The theory of X-binding.

Since the publication of *Lectures on Government and Binding* in 1981 many modifications of the GB approach have appeared. In the present paper we would

<sup>3</sup> Agr is neither in A- nor in  $\bar{A}$ -position. It is in head position. Aoun distinguishes these three kinds of positions in the grammar:

A-positions and  $\bar{A}$ -positions are generally XP positions (the positions of maximal projections). The head position is generally an X<sup>0</sup> position (minimal projection):



Here NP is in an A-position with respect to V.

V is in a head position, it governs the XP position contained in the maximal projection of its head.

like to exploit two of them in particular: “the generalized binding theory” proposed by Joseph Aoun and the analysis of Empty Categories presented by Denis Boucard.

In his work *A Grammar of Anaphora* Aoun presents a broad approach to the binding theory and incorporates  $\bar{A}$ -binding into its framework, thus combining both A-binding and  $\bar{A}$ -binding into X-binding or the generalized binding theory. Aoun closely examines Romance languages and points out that in certain cases in French and Italian Wh-extraction obeys Opacity and the c-domain of the subject NP or S counts as an opaque domain for variables. Another task of the *generalized binding* was to eliminate the redundancy between the binding theory and the ECP<sup>4</sup>. Both the binding principles and the ECP require that a trace left by NP-movement should have a c-commanding antecedent in its governing category (or a lexical governor). For variables the ECP and the binding theory are complementary: the binding theory states that variables must be A-free (not c-commanded by a coindexed NP element in an A-position), the ECP demands that variables be either  $\bar{A}$ -bound by a c-commanding antecedent or governed by a lexical governor.

<sup>4</sup> The ECP reduces to  $\bar{A}$  binding theory in case of variables:

a. \*who<sub>i</sub> do you wonder [ how [ t<sub>i</sub> solved the problem ] ]  
   S          S

b. \*who do you think [ t<sub>i</sub> that [ t<sub>i</sub> saw Bill ] ]

c. \*it is unclear [ who<sub>i</sub> [ what<sub>j</sub> [ t<sub>i</sub> saw t<sub>j</sub> ] ] ]  
   S          S          S

d. it is unclear [ what<sub>j</sub> [ who<sub>i</sub> [ t<sub>i</sub> saw t<sub>j</sub> ] ] ]  
   S          S          S

a. and b. are unacceptable because the variables have no coindexed binders in  $\bar{A}$ -position. The structural description of COMP indexing is not satisfied. c. is a superiority case, the movement that raises the Wh element in argument position adjoins this Quantifier to  $\bar{S}$  marked +wh rather than to COMP. Then  $\bar{S}_0$  - maximal projection blocks proper government of t<sub>i</sub> in c. t<sub>i</sub> is bound only in d.

The ECP and NP traces:

e. John<sub>i</sub> is likely [ t<sub>i</sub> to leave ]  
   S

Under the ECP:

t<sub>i</sub> is governed by the matrix predicate and  $\bar{S}$  is transparent  $\bar{S} \rightarrow S$  with raising predicates. But Theta-criterion also covers these cases. Its requirements for A-chains are as follows:

NP-traces and their antecedents form an A-chain.

An NP in an A-position not coindexed with an NP-trace forms an A-chain by itself.

f. \*John<sub>i</sub> is illegal [ [ t<sub>i</sub> to leave ] ]  
   S S

g. John<sub>i</sub> is certain [ t<sub>i</sub> to leave ]  
   S

In Aoun’s opinion the main function of  $\bar{S}$  deletion with raising predicates is not to allow government but to allow proper chain for a Theta-role transmission, for  $\bar{S}$  breaks an A-chain.



As shown by (18), the mechanism of  $\bar{A}$ -binding is analogous to A-binding:

(18)  $\text{who}_i$  [ $\text{t}'_i$  was killed  $\text{t}_i$ ]  
 $\quad \quad \quad \text{S}$

(18) is an example of double binding where  $\text{t}'$  is bound by a non-argument *who* and becomes an  $\bar{A}$ -bound variable, while  $\text{t}$  is an A-bound NP-trace.  $\bar{A}$ -binding relates a variable to an element in an  $\bar{A}$ -position. The notion of X-binding is central in the generalized binding theory:

(19)  $\alpha$  is X-bound by  $\beta$  if  $\alpha$  and  $\beta$  are coindexed,  $\beta$  c-commands  $\alpha$  and  $\beta$  is in an X-position.

X-binding is either A-binding or  $\bar{A}$ -binding and a possibility that an element can be locally both A-bound and  $\bar{A}$ -bound is excluded. Thus the generalized binding principles are formulated as follows:

- (20) A. An anaphor must be X-bound in its governing category.  
 B. A pronominal must be X-free in its governing category.  
 C. A name must be A-free. (Aoun, 1985)

The theory of X-binding requires two alterations in the formulation of the definition of the governing category. First the notation of accessibility should be formulated which is illustrated in (21):

(21)  $c'$ est a Paul [ $\alpha_1$  que [Marie AGR sait [ $\text{quoi}_j$  [PRO donner  $x_j$   $x_i$ ]]]]  
 $\quad \quad \quad \text{S} \quad \quad \quad \text{S} \quad \quad \quad \text{S} \quad \quad \quad \text{S}$   
 'it is to Paul that Marie knows what to give'

The variables  $x_i$  and  $x_j$  are governed by the verb *donner* but have no accessible SUBJECT. An element in an A-position such as PRO in the embedded clause cannot serve as SUBJECT for a variable - this possibility is excluded by Principle C of the *generalized* binding theory, for a variable must simultaneously meet principles A and C. In (21) the variables cannot have an accessible subject in the matrix clause AGR since it is coindexed with *Marie*. Assuming transitivity of indexing, the variables would end up being A-bound by *Marie* and would thus violate Principle C. Consequently, accessibility must be reformulated:

(22)  $\alpha$  is accessible to  $\beta$  if  $\beta$  is in the c-command domain of  $\alpha$  and coindexing of  $\alpha$ ,  $\beta$  would not violate the i-within-i condition or Principle C of the binding theory. (Aoun, 1985)

By Principle C of the binding theory neither AGR nor any other element in an A-position can function as accessible SUBJECT for a variable in a *nonsubject* position. However on the sentential level SUBJECTS are obligatory by the Extended Projection Principle; although they are not accessible to variables in non-subject positions, these variables have no governing category. But the lack of accessible SUBJECT need not prevent variables from being bound, for in this case the extension of the definition of a governing category in (5b.) applies: a root

sentence becomes a governing category for a governed element which has no SUBJECT.

With variables in the *subject* position the situation is quite different: here AGR can serve as accessible SUBJECT although another problem arises:

(23) a.  $\text{who}_i$  [do you think [ $\text{t}_i$  that [ $x_i$  AGR left]]]  
 $\quad \quad \quad \text{S} \quad \quad \quad \text{S} \quad \quad \quad \text{S}$   
 b.  $\text{who}_i$  [do you think [ $\text{t}_i$  [ $x_i$  AGR left]]]  
 $\quad \quad \quad \text{S} \quad \quad \quad \text{S} \quad \quad \quad \text{S}$

(23a.) is ungrammatical although in both a. and b. embedded AGRs have accessible SUBJECT. The variable in (23a.) is not bound because the presence of "that" in COMP blocks the c-command of the trace (the so called "that-trace effect"). There are two alternative suggestions concerning the lack of c-command in this case: while Kayne (1981c) and Pesetsky (1982a) propose that the presence of "that" in COMP prevents the trace from c-commanding the variable, Aoun and Sportiche suggest the COMP Indexing Rule dealing with such cases:

(24) [ $\dots \bar{X}_i \dots$ ]  $\rightarrow$  [ $\dots \bar{X}_i \dots$ ]  
 $\text{COMP} \quad \quad \quad \text{COMP}_i$   
 if COMP dominates only i-indexed elements. (Aoun, Sportiche, 1981)

Apart from the modification in the notion of accessible SUBJECT, the reformulation of the theory of X-binding brings about an extension of the governing category: since the  $\bar{A}$ -binder is usually in the COMP position, now  $\bar{S}(\text{CP})$  not  $\text{S}(\text{IP})$  is the governing category, at least for variables. Does this slight change bring any unwelcome consequences for the relation of A-binding? As (25) shows, this extension of the governing category is irrelevant for anaphors and pronominals:

(25) [[ $\text{they}_i$  AGR prefer [ $\text{for}$  [NP { $\text{each other}_i$  /  $\text{them}_i$ }] to win ]]]  
 $\text{SS} \quad \quad \quad \text{S} \quad \quad \quad \text{S}$

In his comprehensive analysis of Empty Categories Bouchard (1983) straightforwardly assumes that the relation holding between a Wh-word in COMP and a variable is that of binding. Defining anaphors on a functional basis as "elements requiring an antecedent" (Bouchard, 1983 p. 31) he argues that at the interpretive level of LF variables depend for their interpretation on their Wh-antecedents. As a true reflexive the variable should exhibit four specific properties of the relation of binding: obligatoriness of an antecedent, its uniqueness, locality and a specific structural relation with an antecedent.

(26) \* $[e]$  saw John?  
 $\quad \quad \quad \text{NP}$

(27) \*Who did John give  $\text{t}_i$  to  $\text{t}_i$ ?

(28) \* $\text{t}_i$  told John [ $\text{who}$  [Bill would come to dinner]]  
 $\quad \quad \quad \text{S} \quad \quad \quad \text{S}$



- (29) \*Who<sub>i</sub> did John deplore [ the fact that Mary saw t<sub>i</sub> ]  
NP

As (26-29) show the above mentioned requirements are fulfilled in the case of Wh-movement.

The fourth property of the Wh-word (variable relation, namely the relation of c-command holds between the binder and the bindee, explains the problems in the case of long-distance Wh-movement:

- (30) who do you believe [  $\bar{S}$  t<sub>2</sub> [t<sub>1</sub> saw Mary ]]

- (31) \*Who do you believe [  $\bar{S}$  t<sub>2</sub> that [t<sub>1</sub> saw Mary ]]

- (32) [  $\bar{S}$  Who [did John say [  $\bar{S}$  [t<sup>3</sup> that] [Bill thought [  $\bar{S}$  [ t<sup>2</sup> that] [Peter saw]t<sup>1</sup> ]]]]

The interpretation of the long-distance Wh-movement based on some form of the binding theory (32) must cause serious problems. The successive cyclic analysis of the Wh-movement is untenable, for t<sup>3</sup> and t<sup>2</sup> are not bound by their antecedents due to the lack of c-command; t<sup>3</sup> and t<sup>2</sup> are not immediate constituents of their COMPs' and fail to c-command their bindees.<sup>5</sup>

Therefore Bouchard makes use of Stowell's notion of bridge verbs incorporating the index of their S-complements into their Theta-grid and Kayne's analysis of local relations without COMP to COMP movement. Thus (32) can be interpreted in the following way: verbs have grids into which the indices of their complements enter (for Bouchard  $\bar{S} = V^{\max}$ ). If a matrix V heads an  $\bar{S}$ -complement, the elements within this  $\bar{S}$  bear the index of the matrix V. If the embedded V also has an  $\bar{S}$ -complement, this complement is consequently assigned its index and forms an index chain stretching from the most deeply embedded constituent in the embedded clause to the matrix V. Thus in (32) with all *say*, *think* and *see* being bridge verbs, the index in the V-grid functions as a link between the Wh-word and the variable. This relation holds as long as this chain is not discontinued by a non-bridge verb, lacking an index in its V-grid.

(30) is considerably different from (32) in that the variable in the subject position is not an argument of the verb "see" and does not belong to its V-grid.

<sup>5</sup> Chomsky (1986) invokes the Minimality Condition to yield the that-trace effect:

a. who<sub>i</sub> did you believe [ t'<sub>i</sub> [ e [ t<sub>i</sub> would win ] ] ]  
CP C' IP

\*b. who<sub>i</sub> did you believe [ t'<sub>i</sub> [ that [ t<sub>i</sub> would win ] ] ]  
CP C' IP

In (a.) t<sub>i</sub> is antecedent-governed by t'<sub>i</sub> without barriers intervening, for C' contains no lexical material and is therefore optional.

In (b.) C' must be present because it contains a lexical head "that" which makes C' a barrier for antecedent-government of t<sub>i</sub> by t'<sub>i</sub> by virtue of the Minimality Condition:

i. ...α [ γ ...σ ...β ... ]

ii. α does not govern β in i. if γ is a projection of σ excluding α.

Consequently the relation between the Wh-word and the trace cannot be mediated by the index chain of (*believe*, *see*). But Bouchard claims that, when a solitary element in COMP, a trace is able to percolate some of its features to  $\bar{S}$ (CP). Thus t<sup>2</sup> can in this way enter the V-grid of the matrix verb *believe* and be bound by *who*, with t<sup>1</sup> in turn bound by t<sup>2</sup>.

(31) is ruled out as ungrammatical for two reasons. Firstly, t<sup>2</sup> cannot percolate its features to  $\bar{S}$ , enter the V-grid of the matrix verb and establish a link between itself and the Wh-word. Secondly, t<sup>2</sup> fails to c-command t<sup>1</sup>, both t<sup>1</sup> and t<sup>2</sup> are not bound.

### 3. Topicalisation/scrambling in Polish.

In our analysis of topicalisation/scrambling in Polish we will draw on Aoun's analysis for a detailed mechanism of  $\bar{A}$ -binding and Bouchard's analysis in the case of long Wh-movement and topicalisation in Polish. We would like to suggest that certain aspects of the theory of X-binding could be applied to the interpretation of Polish constructions affected by topicalisation/scrambling. Before we adjourn to the discussion of these constructions we would like to test the assumptions of the X-binding theory on Wh-movement in Polish:

- (33) [  $\bar{S}$  Komu<sub>i</sub> [ pro chcesz [  $\bar{S}$  żeby [ Janek oddał książkę t<sub>i</sub> ] ] ] ] ]  
who<sub>i</sub> do (you) want that John give book (to) t<sub>i</sub>

Clearly in (33) the variable is bound by its antecedent in COMP because it is both c-commanded by it and coindexed with it.

It appears that extractions produced by topicalisation/scrambling have much in common with Wh-movement:

First, they observe the same local restrictions imposed by island conditions and Subjacency:

- (34a.) \*Jana<sub>i</sub> czytałem [ książkę [  $\bar{S}$  któraj [ t<sub>j</sub> krytykowała t<sub>i</sub> ] ] ] ] ]  
NP  $\bar{S}$  S  
John<sub>i</sub> (I) read a book which<sub>j</sub> t<sub>j</sub> criticized t<sub>i</sub> ] ] ] ] ]

- (34b.) \*Kogo<sub>i</sub> czytałem [ książkę [  $\bar{S}$  któraj [ t<sub>j</sub> krytykowała t<sub>i</sub> ] ] ] ] ]  
NP  $\bar{S}$  S  
who<sub>i</sub> did (I) read a book which<sub>j</sub> t<sub>j</sub> criticized t<sub>i</sub> ] ] ] ] ]

- (35a.) \*Jana<sub>i</sub> [ to [  $\bar{S}$  że Maria uderzyła t<sub>i</sub> ] zaskoczyło nas ]  
NP  $\bar{S}$   
John<sub>i</sub> (it) that Mary hit t<sub>i</sub> surprised us

- (35b.) \*Kogo<sub>i</sub> [ to [  $\bar{S}$  że Maria uderzyła t<sub>i</sub> ] zaskoczyło nas ]  
NP  $\bar{S}$   
who<sub>i</sub> (it) that Mary hit t<sub>i</sub> surprised us

(36a.) \*Jana<sub>i</sub> pro zastanawiali się [ kto<sub>j</sub> [ t<sub>j</sub> odwiedza t<sub>i</sub> ] ]  
 $\begin{array}{c} \text{S} \\ \text{S} \end{array}$

John<sub>i</sub> (they) wondered who<sub>j</sub> t<sub>j</sub> visits t<sub>i</sub>

(36b.) \*Kogo<sub>i</sub> pro zastanawiali się [ kto<sub>j</sub> [ t<sub>j</sub> odwiedza t<sub>i</sub> ] ]  
 $\begin{array}{c} \text{S} \\ \text{S} \end{array}$

who<sub>i</sub> (did) they wonder who<sub>j</sub> t<sub>j</sub> visits t<sub>i</sub>

Second, similarly to Wh-movement, a left branch NP can be extracted from within NPs in the process of scrambling which brings about an LBC (Left Branch Condition) violation typical of Polish:

(37a.) Marys<sub>i</sub> znalazłem [ [ t<sub>i</sub> ] [ chusteczkę ] ]  
 $\begin{array}{c} \text{N} \text{ N} \\ \text{N} \end{array}$

Mary's<sub>i</sub> (I) found t<sub>i</sub> handkerchief

(37b.) Czyj<sub>i</sub> (pro) znalazłem [ [ t<sub>i</sub> ] [ chusteczkę ] ]  
 $\begin{array}{c} \text{N} \text{ N} \end{array}$

whose did (I) find t<sub>i</sub> handkerchief

Third, both Wh-movement and topicalisation/scrambling in Polish observe the Specificity Condition, which bars extractions from NPs with specified subjects:

(38a.) O kim<sub>i</sub> [ Piotr słyszał [ opowiadanie t<sub>i</sub> ] ]  
 $\begin{array}{c} \text{S} \\ \text{NP} \end{array}$

About whom<sub>i</sub> did Peter hear a story t<sub>i</sub>

(38b.) O TOMKU<sub>i</sub> [ Piotr słyszał [ opowiadanie t<sub>i</sub> ] ]  
 $\begin{array}{c} \text{S} \\ \text{NP} \end{array}$

+emphasis

About Tom<sub>i</sub> Peter heard a story t<sub>i</sub>

(39a.) \*O kim<sub>i</sub> Piotr słyszał [ opowiadanie Marii t<sub>i</sub> ]  
 About whom<sub>i</sub> did Peter hear Mary's story t<sub>i</sub>

(39b.) \*O TOMKU [ Piotr słyszał [ opowiadanie Marii t<sub>i</sub> ] ]  
 About Tom<sub>i</sub> Peter heard Mary's story t<sub>i</sub>

Fourth, both Wh-movement and topicalisation/scrambling in Polish produce ungrammatical effects of Strong Crossover as in:

(40a.) Kogo<sub>i</sub> [ ona<sub>i</sub> zna t<sub>i</sub> ]  
 Who<sub>i</sub> does she<sub>i</sub> know t<sub>i</sub>

(40b.) \*Marys<sub>i</sub> [ ona<sub>i</sub> zna t<sub>i</sub> ]  
 $\begin{array}{c} \text{S} \end{array}$

Mary<sub>i</sub> she<sub>i</sub> knows t<sub>i</sub>

In her analysis of topicalisation/scrambling constructions in Polish, Willim (1986) presents constructions in which topicalisation/scrambling salvages grammaticality of derivations by preventing Principle C violations at S-structure:

(41) [ Zdjęcie Jana<sub>i</sub> z Paryża ] Maria oddała mu<sub>i</sub> t<sub>j</sub> jeszcze w zeszłym roku  
 $\begin{array}{c} \text{NP}_j \end{array}$   
 John's<sub>i</sub> picture from Paris Mary gave back to him<sub>i</sub> still last year

Here, if it were not for scrambling, the NP *Jana* would end up being both c-commanded and coindexed with the personal pronoun *mu* which would violate Principle C of the binding theory:

(42) \*Maria oddała mu<sub>i</sub> [ zdjęcie Jana<sub>i</sub> z Paryża ] jeszcze przed wyjazdem  
 $\begin{array}{c} \text{NP} \end{array}$

Mary gave back to him<sub>i</sub> John's<sub>i</sub> picture from Paris still before the departure

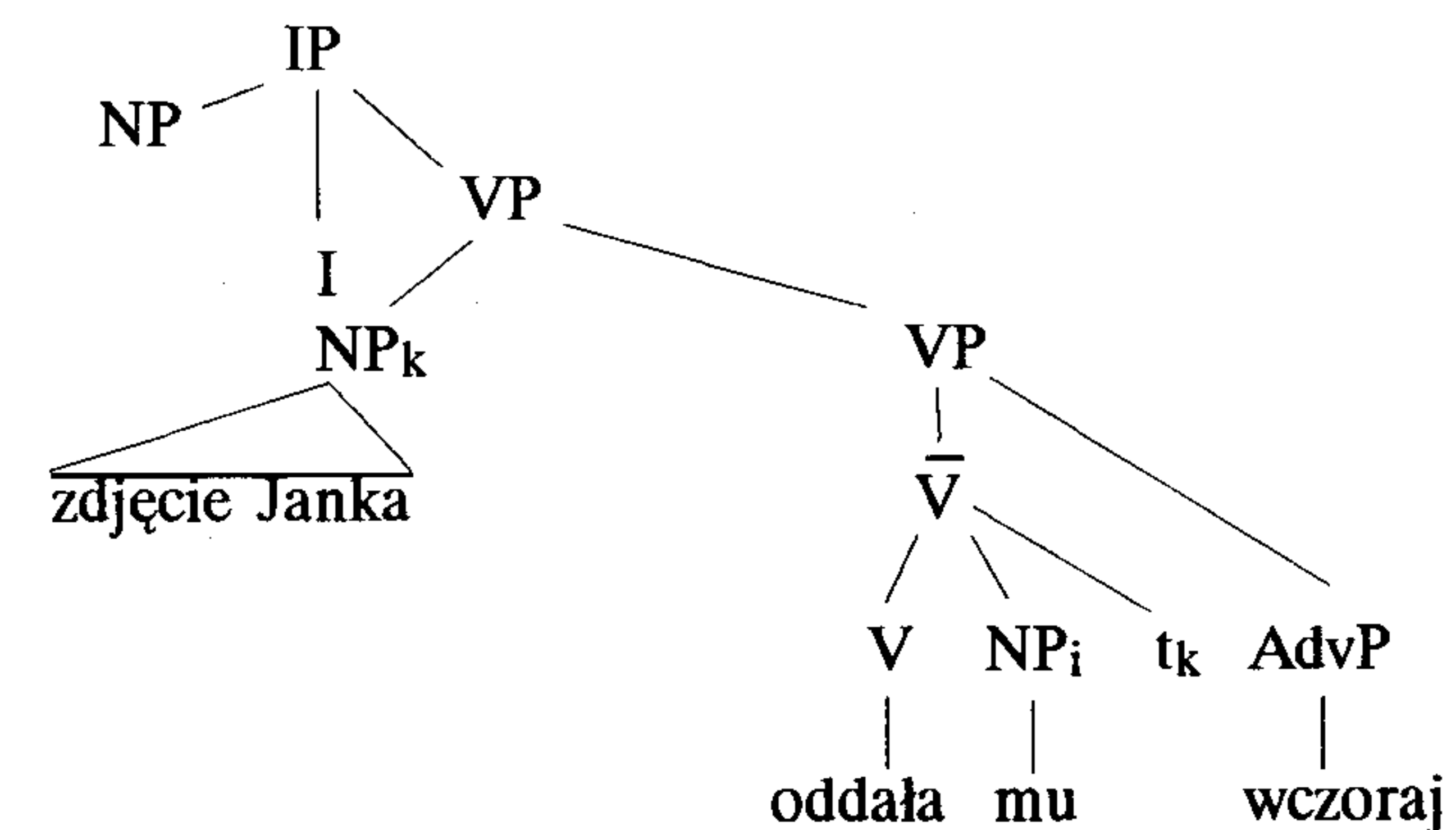
In a very relevant way (41) stands out from other examples of scrambling, here the process of topicalisation/scrambling is obligatory in the sense that its absence would prohibit the derivation of a well formed sentence. In other words it seems that in the case of (41) topicalisation/scrambling must take place in order to prevent a Principle C violation. In the other examples in this paper topicalisation/scrambling is optional in the sense that its application does not affect grammaticality of these structures. We shall return to this problem in the final part of this paper.

In (43), similarly to (41), scrambling within VP prevents a Principle C violation:

(43) Maria [ [ zdjęcie Janka<sub>i</sub> ] oddała mu<sub>i</sub> t<sub>k</sub> wczoraj ]  
 $\begin{array}{c} \text{VP} \text{ NP}_k \end{array}$

Mary [ John, s<sub>i</sub> picture ] gave back to him<sub>i</sub> t<sub>k</sub> yesterday  
 $\begin{array}{c} \text{NP}_k \end{array}$

where:



*Janka* does not c-command *mu* and is not c-commanded by it either. *Mu* c-commands t<sub>k</sub>, its sister node under  $\bar{V}$ , but obviously it bears a different index. As we can see, both (41) and (43) prove that adjunction to IP and reordering within VP prevent the Principle C violations and are not only stylistic adjustments.

Fifth, both movement operations are limited in their scope by the same locality conditions. Interestingly, Wh-extractions and topicalisation from an embedded



clause are allowed only in the case of infinitival complement clauses and *żeby*-complement clauses of the verbs which also take infinitival complements:

(44a.)  $\left[ \begin{array}{c} \bar{S} \\ \text{co}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{pro} \\ \text{chcesz} \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ \text{PRO} \text{ czytać } t_i \end{array} \right] \right] \right]$

what<sub>i</sub> do (you) want PRO to read t<sub>i</sub>

(44b.)  $\left[ \begin{array}{c} \text{Książkę}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{pro} \\ \text{chcesz} \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ \text{PRO} \text{ czytać } t_i \end{array} \right] \right] \right]$

A book<sub>i</sub> (you) want to read t<sub>i</sub>

(45a.)  $\left[ \begin{array}{c} \bar{S} \\ \text{co}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{pro} \\ \text{chcesz} \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ t_i \text{ żeby } \left[ \begin{array}{c} \text{pro} \\ \text{czytał } t_i \end{array} \right] \end{array} \right] \right] \right]$

what<sub>i</sub> do (you) want t<sub>i</sub> that (I) read t<sub>i</sub>

(45b.)  $\left[ \begin{array}{c} \text{Książkę}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{pro} \\ \text{chcesz} \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ t_i \text{ żeby } \left[ \begin{array}{c} \text{pro} \\ \text{czytał } t_i \end{array} \right] \end{array} \right] \right] \right]$

A book<sub>i</sub> (you) want t<sub>i</sub> that (I) read t<sub>i</sub>

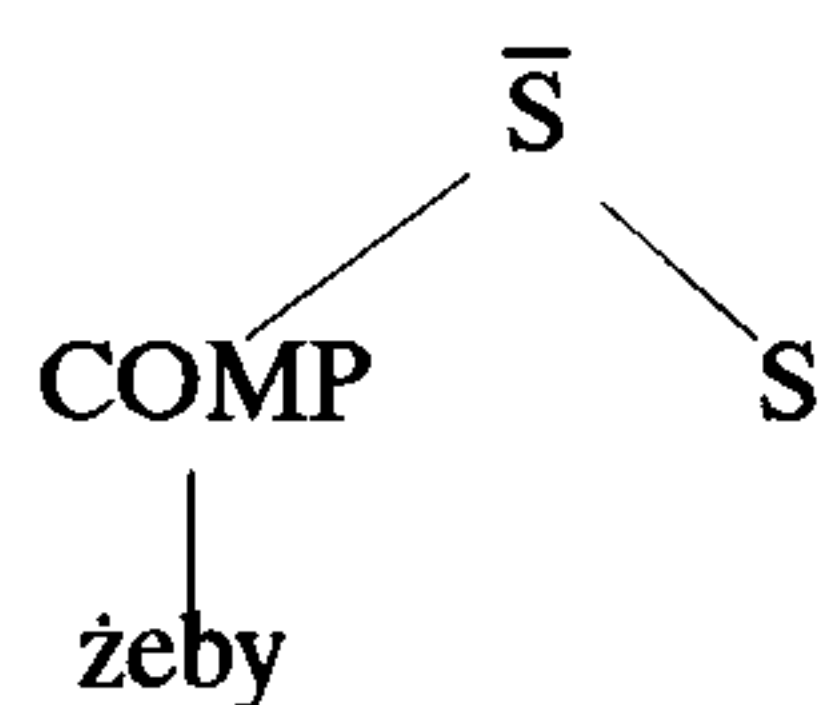
We might claim that in the case of long distance topicalisation in infinitival clauses in Polish the  $\bar{A}$ -binding relation holds across the  $\bar{S}$ (CP) boundary if the topicalised element has an available landing site in a free COMP. And the COMP shares the status of  $\bar{A}$ -position with the target adjunct position. But such stipulation proves wrong in the case of *żeby*-clauses. The COMP Indexing Rule (24) should rigorously prohibit any extractions from *żeby* clauses, assuming that in Polish (24) blocks unwelcome extractions from *any* positions within the clause. But in fact these clauses fall into two opposite categories with respect to extraction/topicalisation: *żeby*-complement clauses of the verbs which also allow infinitival complements are *transparent* whereas *żeby*-complement clauses of other verbs are *opaque*.

(46)  $\left[ \begin{array}{c} \bar{S} \\ \text{o co}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{pro} \\ \text{zadzwoń } t_i \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ t_i \text{ żeby } \left[ \begin{array}{c} \text{PRO} \\ \text{zapytać } t_i \end{array} \right] \end{array} \right] \right] \right]$

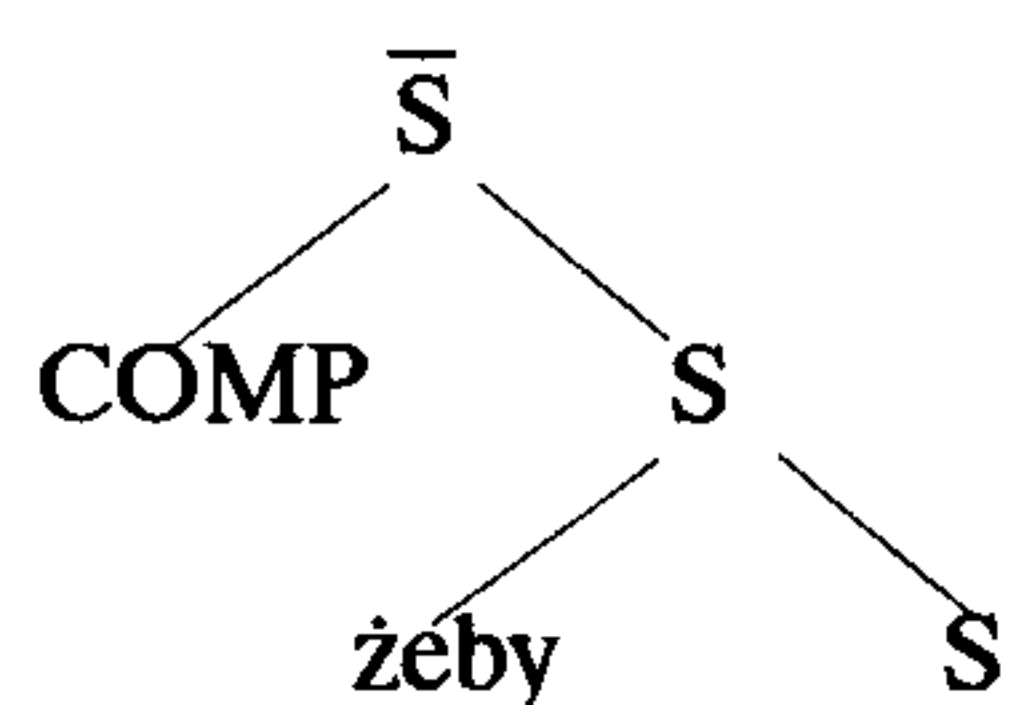
about what<sub>i</sub> did (he) call t<sub>i</sub> that PRO ask t<sub>i</sub>

Since *żeby*-clauses fall into two different categories we could reasonably suggest that there are two types of *żeby* COMPs:

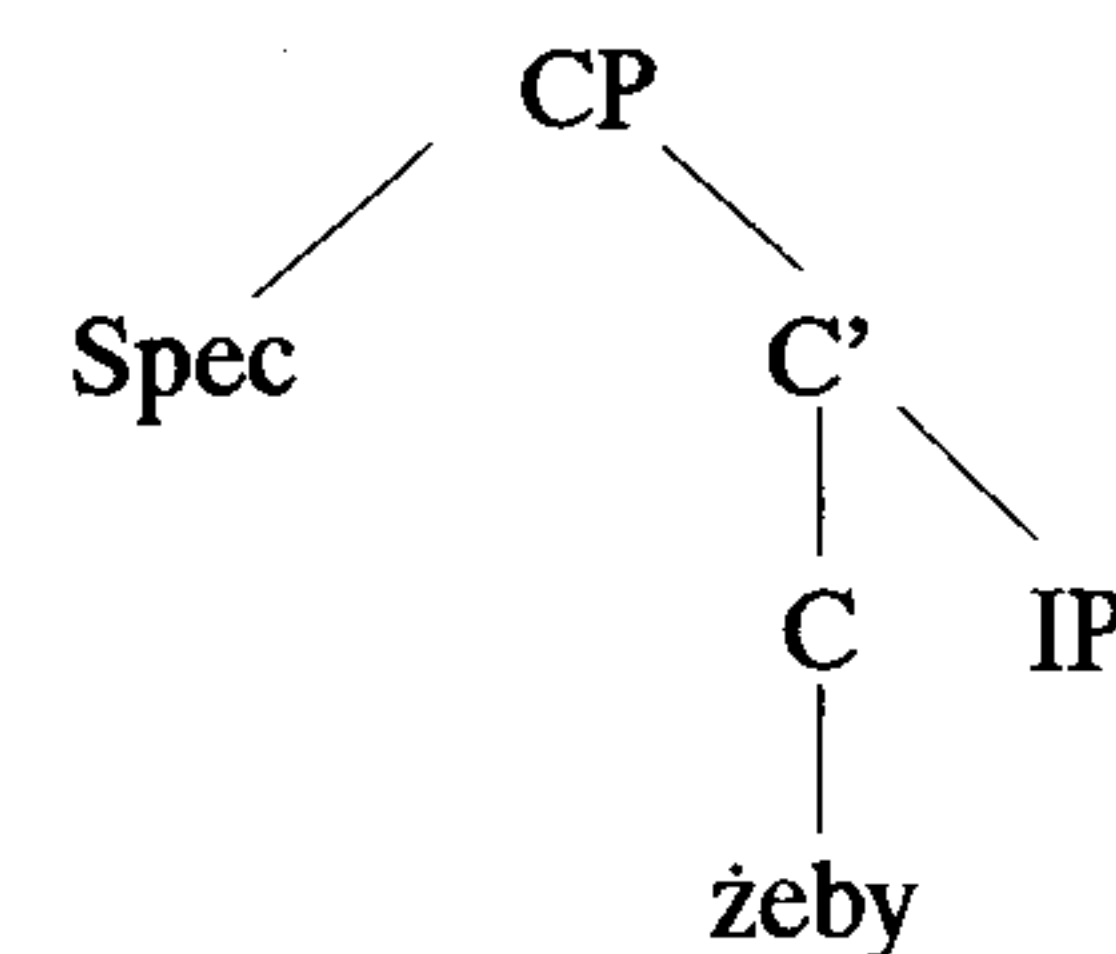
(47) a.



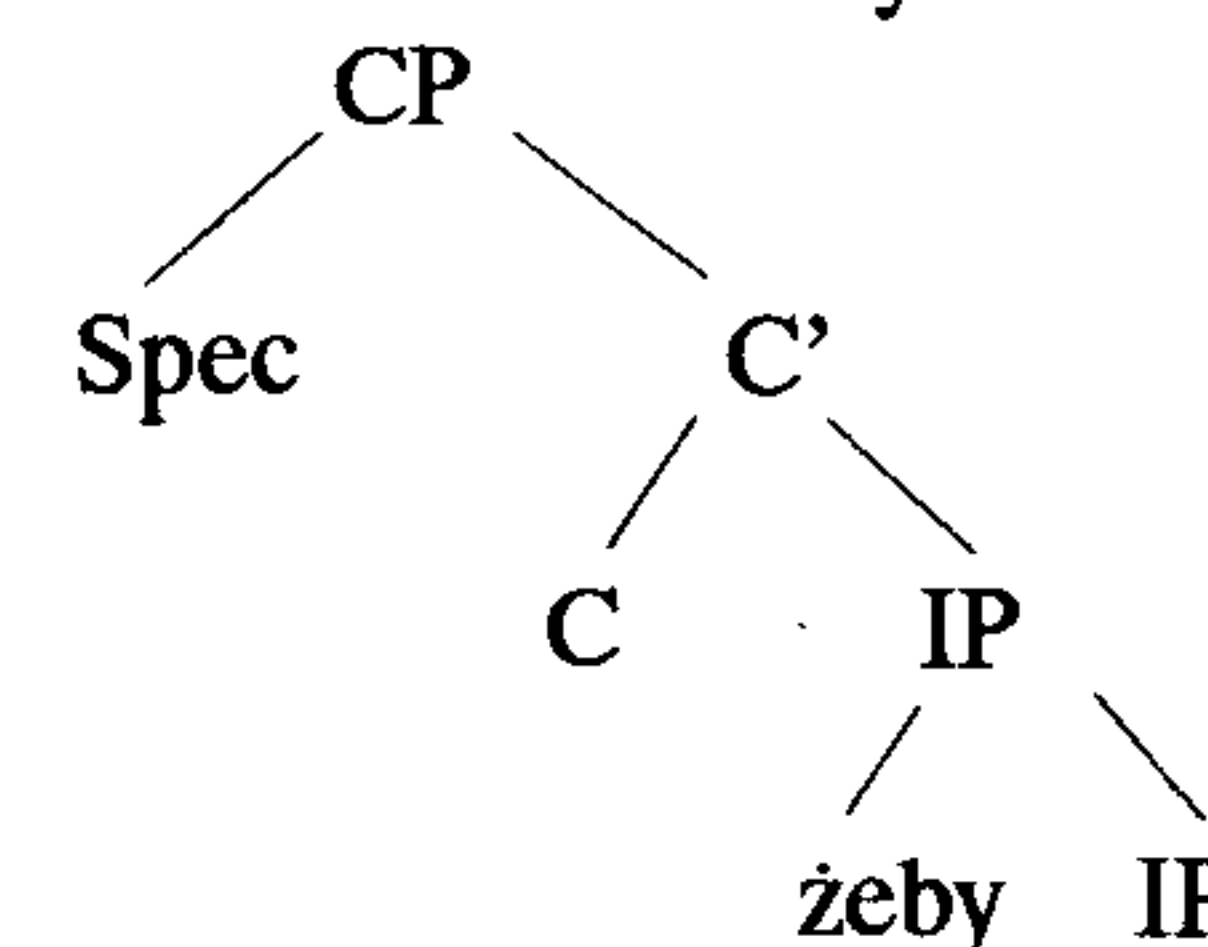
b.



or



or alternatively



In (47a.) *żeby* is in COMP and blocks the application the COMP Indexing Rule which is tantamount to prohibiting extraction and topicalisation out of the c-command of *żeby*. Structure (47a.) could correspond to *żeby*-complement clauses of the verbs which do not take infinitival complements. In (47b.) *żeby* is not in COMP but is adjoined to S(IP), its position is not coindexed with COMP and thus extraction and topicalisation are possible. (47b.) could correspond to the transparent type of *żeby*-clauses.

Superficially (48) appears to be a counterexample to (47):

(48)  $\left[ \begin{array}{c} \bar{S} \\ \text{pro} \\ \text{chcesz} \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ \text{żeby } \left[ \begin{array}{c} \text{co}_i \\ \text{przeczytał } t_i \end{array} \right] \end{array} \right] \right]$

(you) want that (I) what<sub>i</sub> read t<sub>i</sub>

(49)  $\left[ \begin{array}{c} \bar{S} \\ \text{pro} \text{ zastanawiam się } \left[ \begin{array}{c} \bar{S} \\ \text{żeby } \left[ \begin{array}{c} \text{komu}_i \\ \text{[Janka przedstawić } t_i \end{array} \right] \end{array} \right] \end{array} \right]$

(I) wonder that to whom<sub>i</sub> John to introduce t<sub>i</sub>

The difference between (48) and (49) is that the verb *chcieć* takes both the infinitival complement and the *żeby*-complement while *zastanawiać się* does not take the infinitival complement.

The counterparts of (48) and (49) formed by the application of both Wh and echo questions show differences in grammaticality analogous to the effects of Wh-extraction from two types of *żeby*-clauses:

(50)  $\left[ \begin{array}{c} \bar{S} \\ \text{kogo}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{pro} \\ \text{chcesz} \\ \text{S} \end{array} \left[ \begin{array}{c} \bar{S} \\ \text{[ } \left[ \begin{array}{c} \bar{S} \\ \text{żeby } \left[ \begin{array}{c} \text{komu}_j \\ \text{[ Janek przedstawił } t_j \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right] \right]$

who<sub>i</sub> do (you) want that to whom<sub>j</sub> John to introduce t<sub>j</sub> t<sub>i</sub>

<sup>6</sup> The idea of IP adjunction of Wh words in Polish was presented in Lasnik and Saito 1984 in their analysis of the lack of That Trace Effect in multiple Wh fronting in Polish: where both a. and b. are grammatical although b. should show the That Trace Effects:

a. Maria zastanawiała się  $\left[ \begin{array}{c} \bar{S} \\ \text{kto}_i \text{ co}_j \\ \text{S} \end{array} \left[ \begin{array}{c} \text{[ } t_i \text{ przyniesie } t_j \end{array} \right] \right]$

Mary wondered  $\left[ \begin{array}{c} \bar{S} \\ \text{who}_i \text{ what}_j \\ \text{S} \end{array} \left[ \begin{array}{c} \text{[ } t_i \text{ will bring } t_j \end{array} \right] \right]$

b. Maria zastanawiała się  $\left[ \begin{array}{c} \bar{S} \\ \text{co}_j \text{ kto}_i \\ \text{S} \end{array} \left[ \begin{array}{c} \text{[ } t_i \text{ przyniesie } t_j \end{array} \right] \right]$

Mary wondered  $\left[ \begin{array}{c} \text{[ } \text{what}_j \text{ who}_i \\ \text{[ } t_i \text{ will bring } t_j \end{array} \right]$

Lasnik and Saito suggested that in order to avoid ECP violations only the first Wh word is in the COMP and others are S(IP) adjoined.

- (51)  $\frac{*}{S} [ \text{kogo}_i [ \text{pro} \text{ zastanawiasz} \text{ się} \frac{[ \text{żeby} \text{ komu}_j [ \text{Janek} \text{ przedstawił} \text{ } t_j \text{ } t_i ] ] ] ] ]$   
 who<sub>i</sub> (you) wonder that to whom<sub>j</sub> John (should) introduce

Just like in (46), in (51) the extraction of a Wh-word from the *żeby*-clause is blocked since this clause is opaque, whereas in (45a.) and (50) it is transparent and allows Wh-movement. Consequently, we could assume that the distinction made in (47a,b) stands and that in (51) Wh-movement to matrix COMP is blocked due to a violation of the COMP Indexing Rule. In the case of (50) the rule is not violated, for *żeby* is S(IP) adjoined and not coindexed with COMP.

Another non-Wh-word occurring in COMP in Polish - *że* does not allow any extraction or topicalisation and its position corresponds to (47a.):<sup>7</sup>

- (52)  $\frac{*}{S} [ \text{co}_i [ \text{Janek} \text{ wie} \frac{[ \text{że} [ \text{Marysia} \text{ kupiła} \text{ } t_i ] ] ] ] ]$   
 what<sub>i</sub> does John know that Mary bought  $t_i$
- (53)  $\frac{*}{S} [ \text{kto}_i [ \text{Janek} \text{ wie} \frac{[ \text{że} [ \text{ } t_i \text{ kupił} \text{ meble} ] ] ] ] ]$   
 who<sub>i</sub> does John know that  $t_i$  bought furniture

It is worth noting that the X-binding theory can deal with cases of long distance Wh-movement in Polish which elude Subjacency. If in the Slavonic languages both S(CP) and S(IP) count as bounding nodes, practically any syntactic movement should be clause bound. Subjacency is then violated in extractions from infinitival clauses:

- (54)  $\frac{[ \text{kogo}_i [ \text{pro} \text{ chcesz} \frac{[ [ \text{PRO} \text{ pobić} \text{ } t_i ] ] ] ] ] ]}{S \quad S \quad S \quad S}$   
 who<sub>i</sub> do (you) want PRO to beat up  $t_i$

<sup>7</sup> Extractions from the subject position poses certain problems for the approach presented here. Although the That Trace Effect, discussed among others in Lasnik and Saito 1984, rules out extraction from the subject position when COMP is filled, e.g.

- a.  $\text{Kto}_i [ \text{Maria} \text{ chce} \frac{[ \text{żeby} [ \text{ } t_i \text{ kupił} \text{ jabłka } ] ] ] ]$   
 S S

its results in Polish are rather ambiguous. With *pro* in the matrix subject position a. becomes much more acceptable:

- a.  $\text{Kto}_i [ \text{pro} \text{ chcesz} \frac{[ \text{żeby} [ \text{ } t_i \text{ kupił} \text{ jabłka } ] ] ] ]$   
 S

who<sub>i</sub> do you want that  $t_i$  buy apples

which is in favour of (34b) with “*żeby*” adjoined to IP.

But ungrammaticality of b. and c.:

- b.  $\text{Janek}_i [ \text{pro} \text{ chcesz} \frac{[ \text{żeby} [ \text{ } t_i \text{ kupił} \text{ jabłka } ] ] ] ]$   
 S S S

- c.  $\text{Janek}_i [ \text{Marysia} \text{ chce} \frac{[ \text{żeby} [ \text{ } t_i \text{ kupił} \text{ jabłka } ] ] ] ]$   
 S S S

shows That Trace Effects (or COMP Indexing Rule) violations.

- (55)  $\frac{[ \text{kogo}_i [ \text{pro} \text{ chcesz} \frac{[ [ \text{żeby} [ \text{Janek} \text{ pobił} \text{ } t_i ] ] ] ] ] ] ]}{S \quad S \quad S \quad S \quad S}$   
 who<sub>i</sub> do (you) want John to beat up  $t_i$

Our approach surpasses the inefficiencies of Subjacency because by means of the COMP Indexing Rule the variables in (54) and (55) have their antecedents in COMP positions and are properly bound, c-commanded and coindexed with the variable.

On the other hand though, it seems that it would be better to retain the basic claim that in the Slavonic languages S(IP) and  $\bar{S}$ (CP) constrain extraction. If, following Aoun's analysis of English, we assumed that in Polish the governing category for a variable was the whole matrix sentence, we would have serious problems with ruling out (56) as ungrammatical:

- (56)  $\frac{*}{S} [ \text{co}_i [ \text{wuj} \text{ kazał} \frac{[ [ \text{żeby} [ \text{Zosia} \text{ zechciała} \frac{[ [ \text{żeby} [ \text{Jan} \text{ zjadł} \text{ } t_i ] ] ] ] ] ] ] ] ] ] ] ]$   
 S S S S S S S S  
 what<sub>i</sub> did the uncle order that Zosia (should) want John to eat  $t_i$

(56) is definitely ungrammatical although it contains two transparent *żeby*-clauses allowing unbounded Wh-extraction. Due to the coindexation holding between SUBJECT and the subject NP, the variable, or the trace of topicalisation, in object position cannot have a governing category. But still too long extraction can not be allowed. It is difficult to find any ready-made answer. The key factor could be the presence of higher S(IP) and  $\bar{S}$ (CP) nodes blocking the movement irrespective of an available COMP position. We could then additionally assume that in Polish long distance Wh-extraction or topicalisation can move elements only to the first superordinate clause and that it can apply only once.

Alternatively, we could pursue another line of argument, that of Bouchard's index chain formation. We could assume that in Polish as opposed to English and other languages allowing long Wh-movement, index chain cannot form, for in core cases most verbs are [-bridge] V and do not insert their  $\bar{S}$ -complements into their Th-grids. The verbs taking infinitival and *żeby*-complements are marked exceptions and thus extractions from their  $\bar{S}$ -complements of both Wh-words and topicalised arguments, are possible. Even then though, the number of links in the index chain of these verbs is limited to only two.

Sixth, both topicalisation/scrambling and Wh-movement trigger off parasitic gap constructions. This syntactic phenomenon, first observed by Taraldsem and then discussed by many authors including Chomsky (1982, 1986) occurs only in constructions affected earlier by a syntactic movement (Wh-movement):

- (57) Which book<sub>i</sub>  $\frac{[ \text{did you file } t_i \text{ without reading } e_i ]}{S}$

where  $e_i$  stands for a parasitic gap.

Thus we can apply the parasitic gap criterion test to topicalisation/scrambling structures:



- (58) Maria przysłała do mnie studenta nie uprzedziwszy go o konsekwencjach.  
Mary sent to me a student without warning him about the consequences.

Parasitic gap  $e_i$  appears as a result of Wh-movement, therefore (60) is grammatical but (59) is not:

- (59) \*Maria przysłała do mnie studenta nie uprzedziwszy  $e_i$  o konsekwencjach.  
Mary sent to me a student without warning  $e_i$  about the consequences.

- (60) [ którego studenta<sub>i</sub> [ Maria przysłała do mnie  $t_i$  nie uprzedziwszy  $e_i$  o konsekwencjach ] ]  
which student<sub>i</sub> did Mary send to me  $t_i$  without warning  $e_i$  about the consequences

Consequently, if a parasitic gap appeared following topicalisation/scrambling, this movement could be classified in the same category as Wh-movement.

- (61) [studenta<sub>i</sub> [Maria przysłała do mnie  $t_i$  nie uprzedziwszy  $e_i$  o konsekwencjach. ] ]  
a student<sub>i</sub> Mary sent to me  $t_i$  without warning  $e_i$  about the consequences.

(61) seems grammatical, especially with focal stress on the topicalised NP. If so, topicalisation (IP adjunction) tests positive for parasitic gap licensing. Scrambling of the direct object within VP produces exactly the same results, again with focal stress on *studenta*:

- (62) Maria [ studenta<sub>i</sub> przysłała do mnie  $t_i$  nie uprzedziwszy  $e_i$  o konsekwencjach. ]  
Mary a student<sub>i</sub> sent to me  $t_i$  without warning  $e_i$  about the consequences.

The analyses of (61) and (62) show that the process of topicalisation/scrambling belongs to the category of syntactic movement because it produces the parasitic gap effect.

The above mentioned similarities cannot obscure the fact that there is no 100% overlap between Wh-movement and topicalisation/scrambling. We shall present at least two differences between them besides the fact that in certain languages topicalisation/scrambling is a frequent phenomenon, whereas in others it is confined to literary style and poetry.

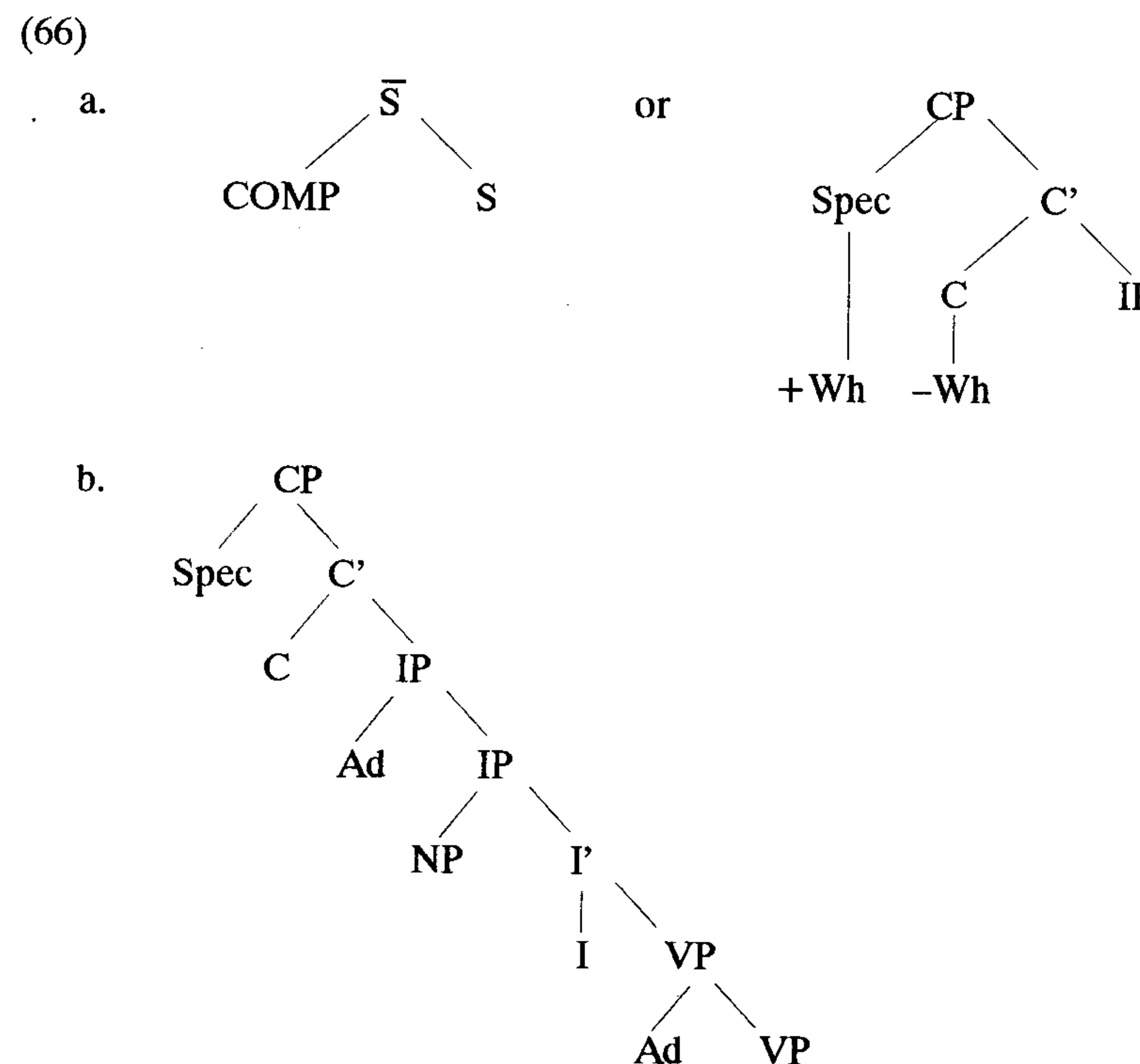
These two syntactic phenomena do not exhibit the Weak Crossover effect to the same extent, as Wilim discusses these two examples:

- (63) \* [ kogo<sub>i</sub> [ podziwiają [ jego<sub>i</sub> przyjaciele ]  $t_i$  ] ]  
S S NP<sub>j</sub>  
who<sub>i</sub> do admire his<sub>i</sub> friends  $t_i$
- (64) [ Janka<sub>i</sub> [  $t_j$  podziwiają [ jego<sub>i</sub> przyjaciele ]  $t_i$  ] ]  
S S NP<sub>j</sub>  
John<sub>i</sub>  $t_j$  admire his friends  $t_i$

- (65) [ Janka<sub>i</sub> [ [ jego<sub>i</sub> przyjaciele ] podziwiają  $t_i$  ] ]  
S SNP<sub>j</sub>  
John his<sub>i</sub> friends admire  $t_i$

While (63) is ungrammatical<sup>8</sup>, for it obviously violates the Weak Crossover Constraint, (64) and (65) are not. This indicates that the left displacement of a topicalised element results in a somewhat weaker, acceptable violation of the constraint than its movement into COMP. Wilim observes that a similar asymmetry holds between cases of topicalisation/scrambling and Wh-movement in Japanese. This fact made Saito and Hoji (1983) distinguish between the class of operators proper, including Wh-operators and quantifiers which produce the Weak Crossover effect, and the class of quasi operators, IP or VP adjoined phrases, which can freely prepose without violating the constraint.

This division into operators proper and quasi operators is certainly justified by their respective positions in the phrase marker. While Wh-words are in most cases under COMP, topicalised/scrambled constituents are placed in IP or VP or adjoined positions:



<sup>8</sup> Wilim (1986) applies the Constraint on Pronominal Binding (CPB) to account for differences in grammaticality between a. and b.:

- a. Kto<sub>i</sub> zastanowił się, czy on<sub>i</sub> dostanie stypendium?  
who<sub>i</sub> was wondering if he<sub>i</sub> would get a scholarship

There is however one reservation that should be put forward in the discussion of Wh-operators in Polish and other languages displaying multiple Wh-fronting: Wh-operators following the first one in a multiple Wh construction can be said to occupy IP adjoined positions which could again strengthen the affinity between them and topicalised phrases, justifying their similar treatment with respect to the X-binding theory.<sup>9</sup>

The other obvious difference between the two processes under our analysis is the rightward movement of the subject in scrambling, quite frequent in spoken Polish, having no counterpart in Wh-movement. The relation of  $\bar{A}$ -binding holding between traces and their antecedents in topicalisation/scrambling from the object position is straightforward:

b. Kto<sub>i</sub> zastanowił się, czy pro<sub>i</sub> dostanie stypendium?

who<sub>i</sub> was wondering if pro<sub>i</sub> would get a scholarship

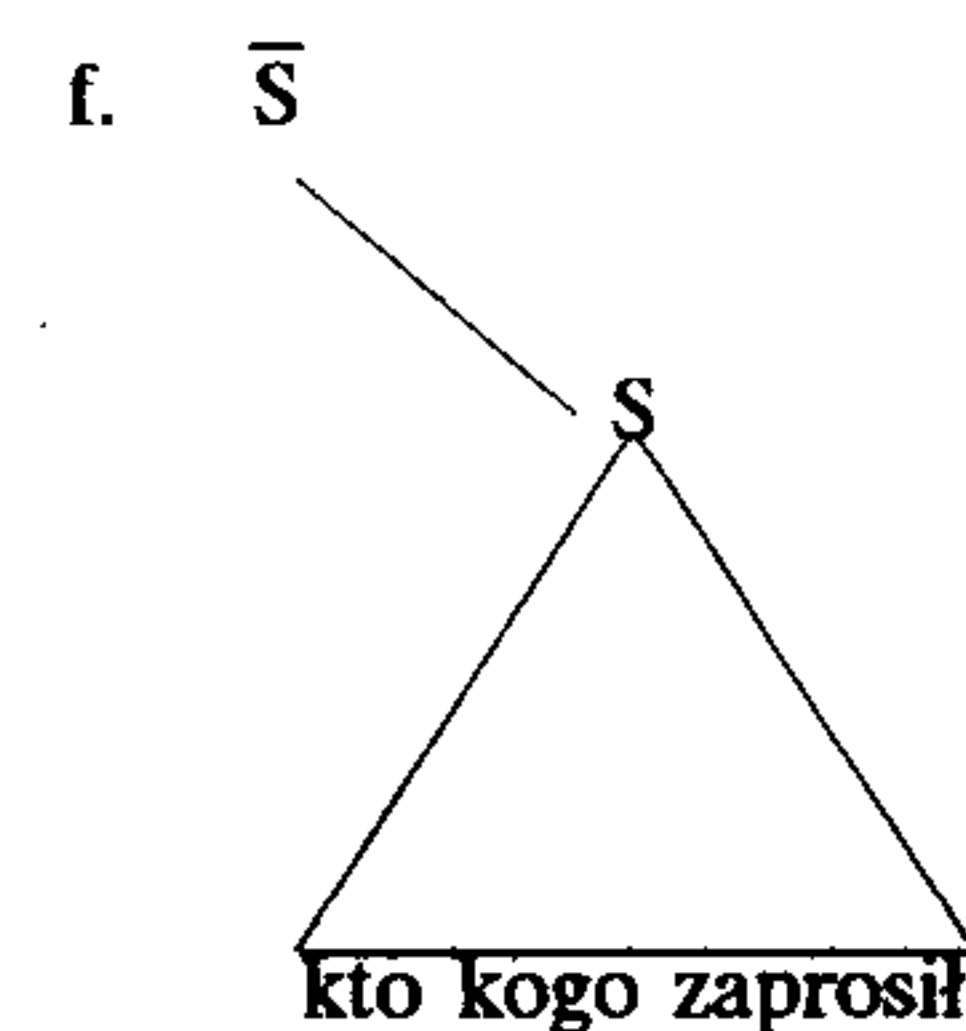
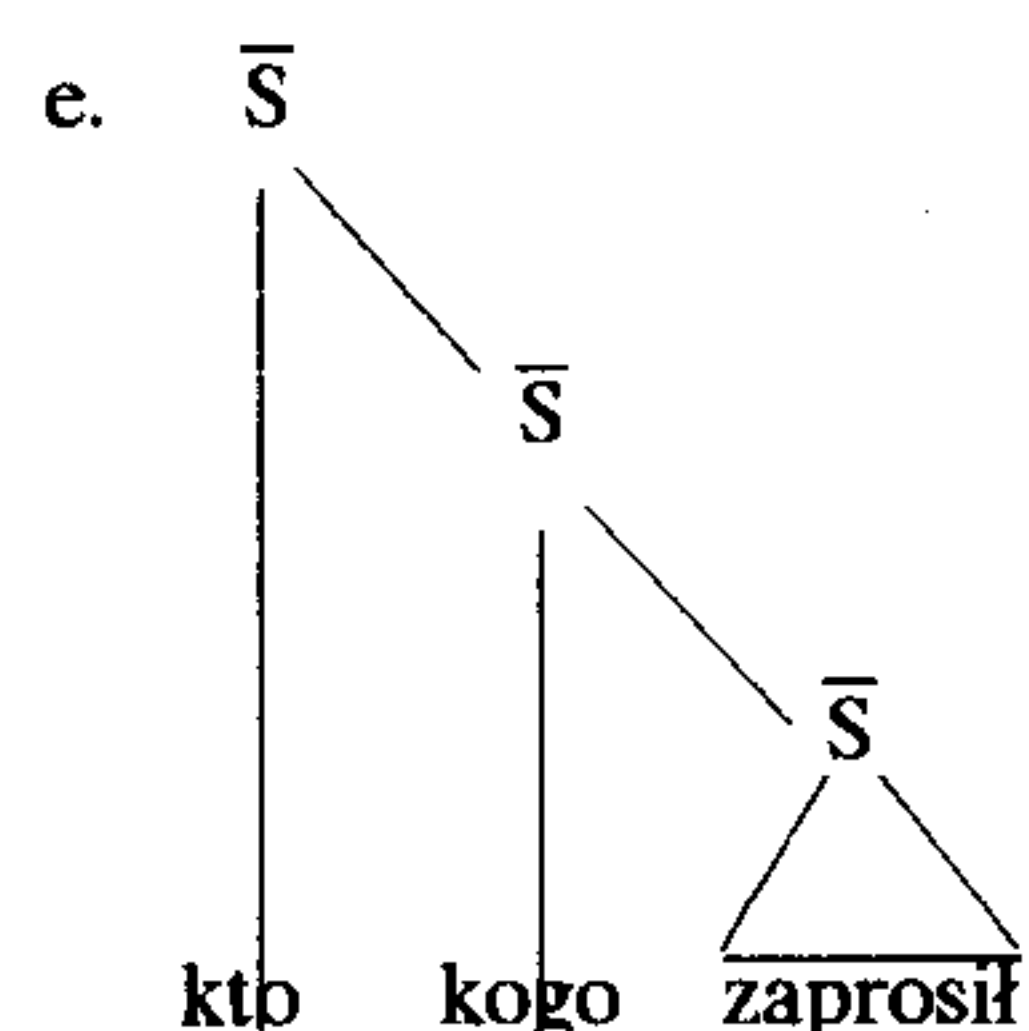
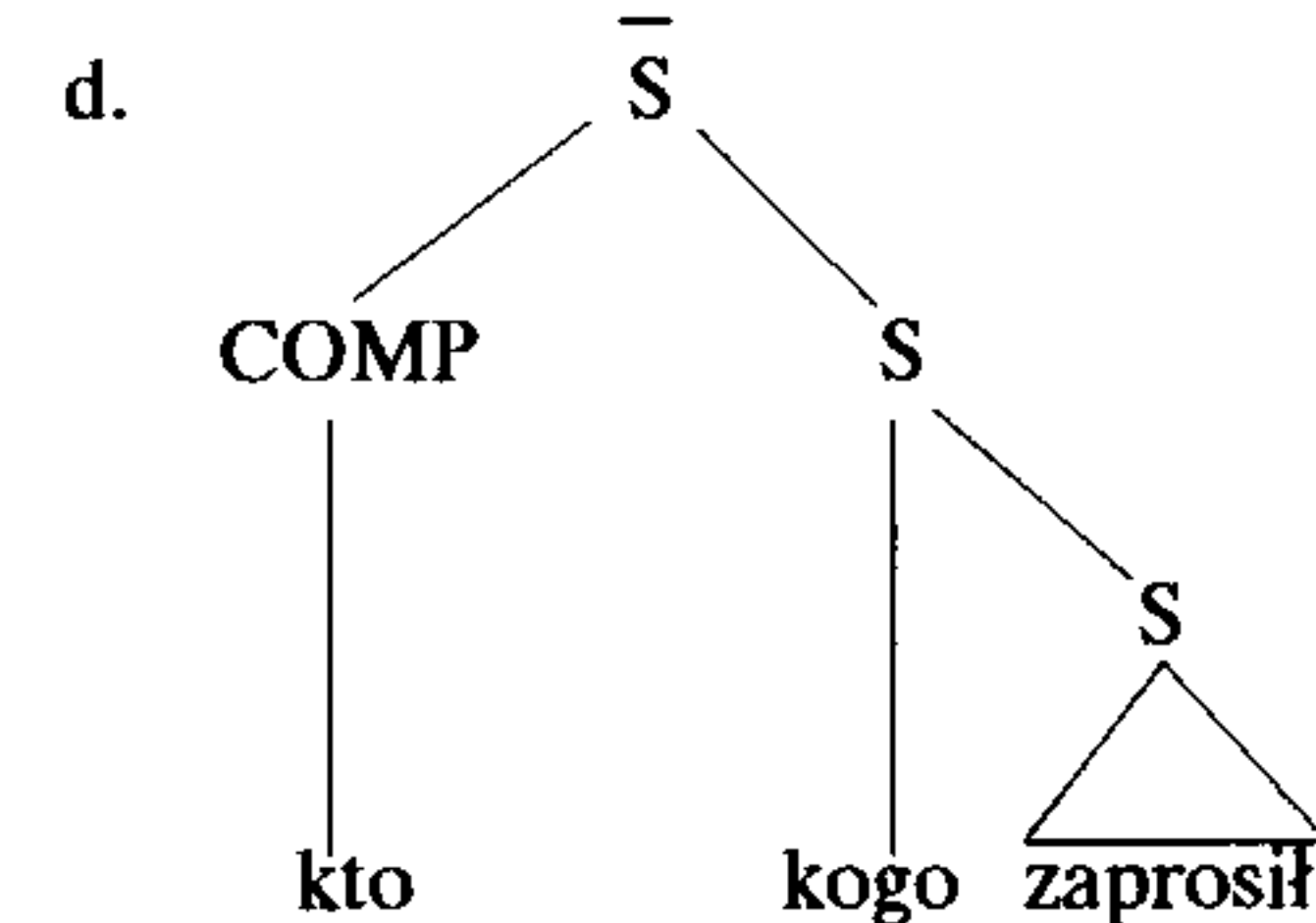
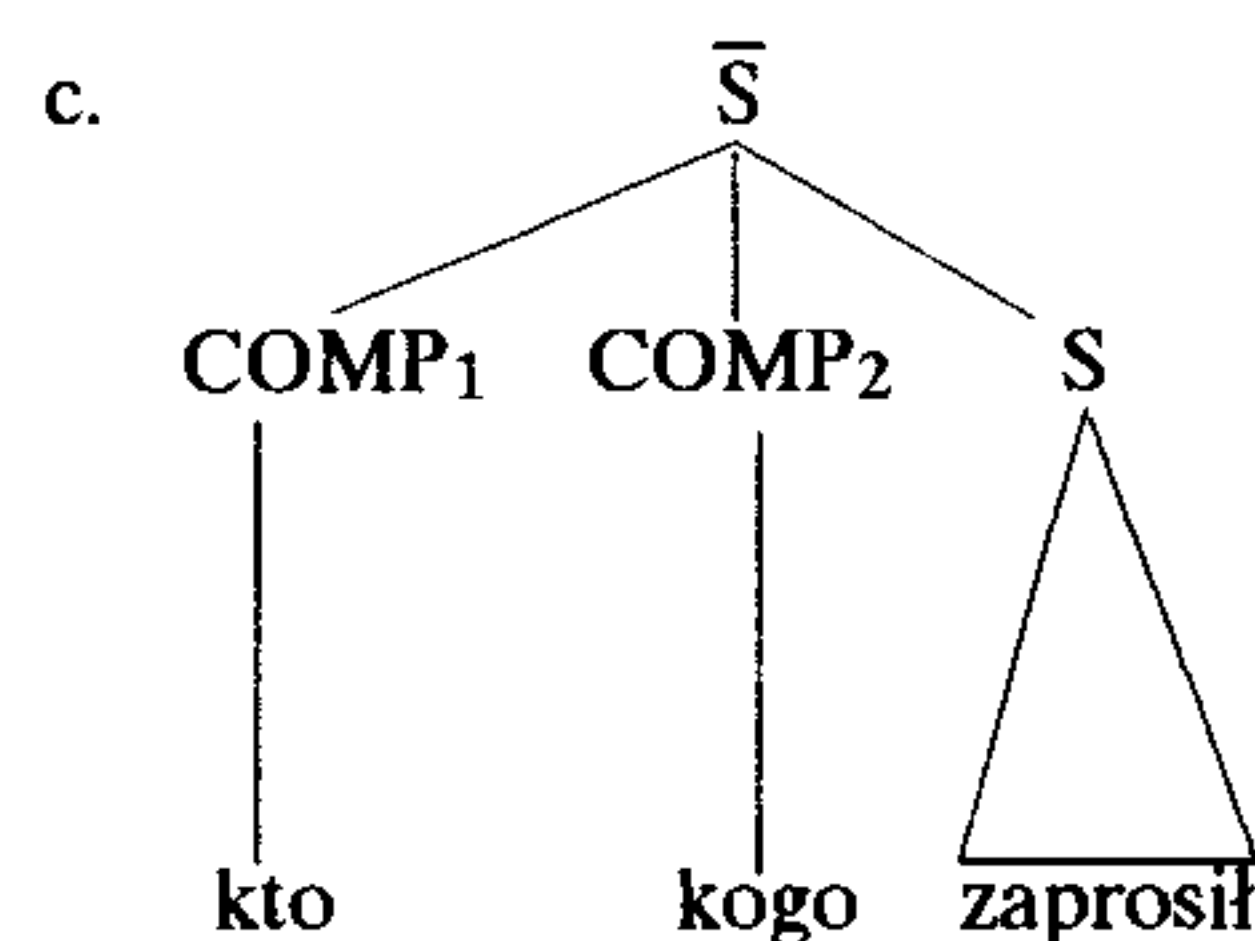
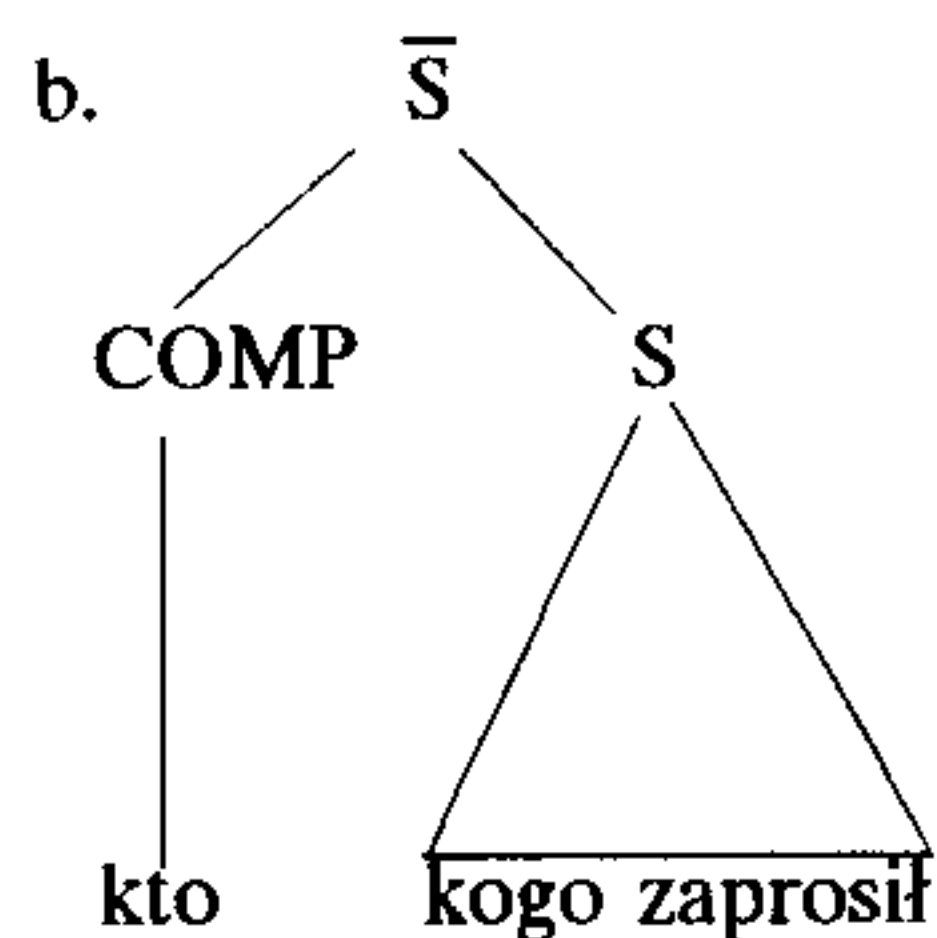
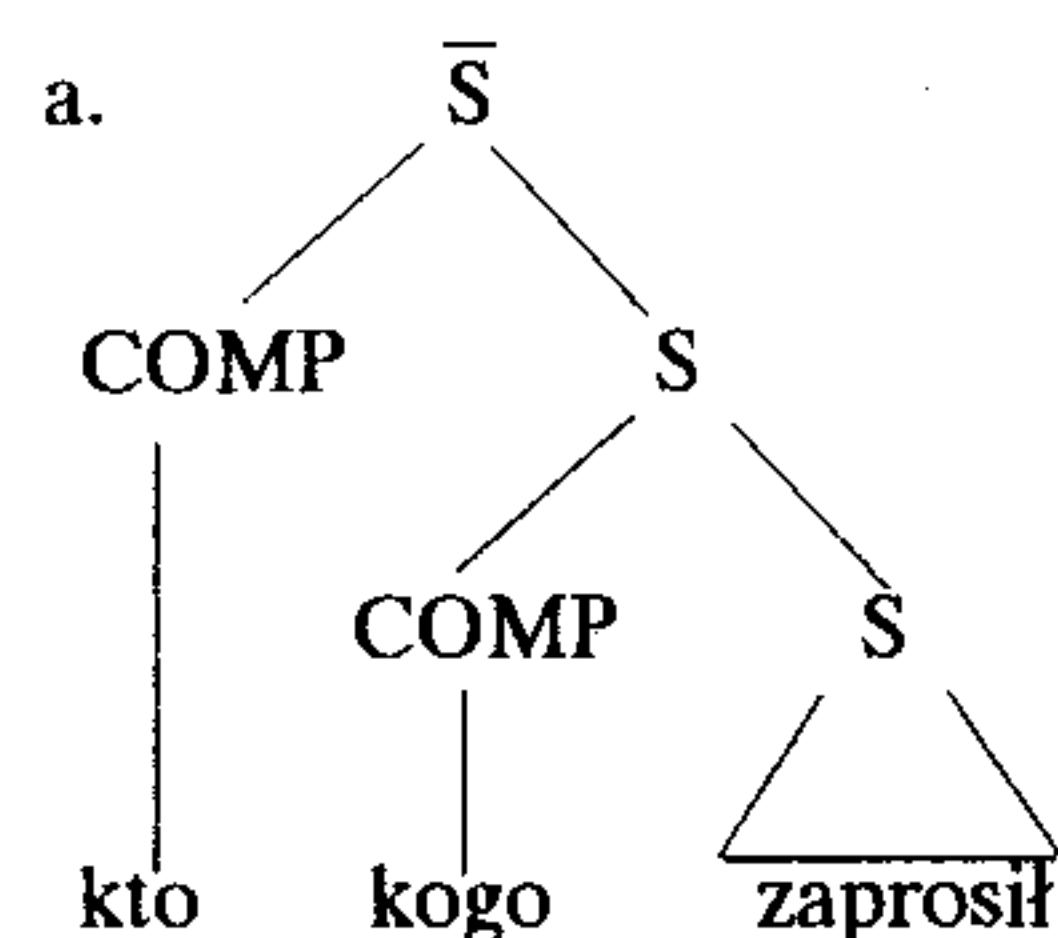
She concludes that whereas both Polish and English observe the constraint in its original formulation:

An overt pronoun must be locally A-free at LF.

only Polish is subject to the further refinement of the constraint:

An overt pronoun must be  $\bar{A}$ -free if it occurs in a position in which pro may occur.

<sup>9</sup> In his recent paper Zabrocki (1989) presents several options for multiple Wh-fronting structures:

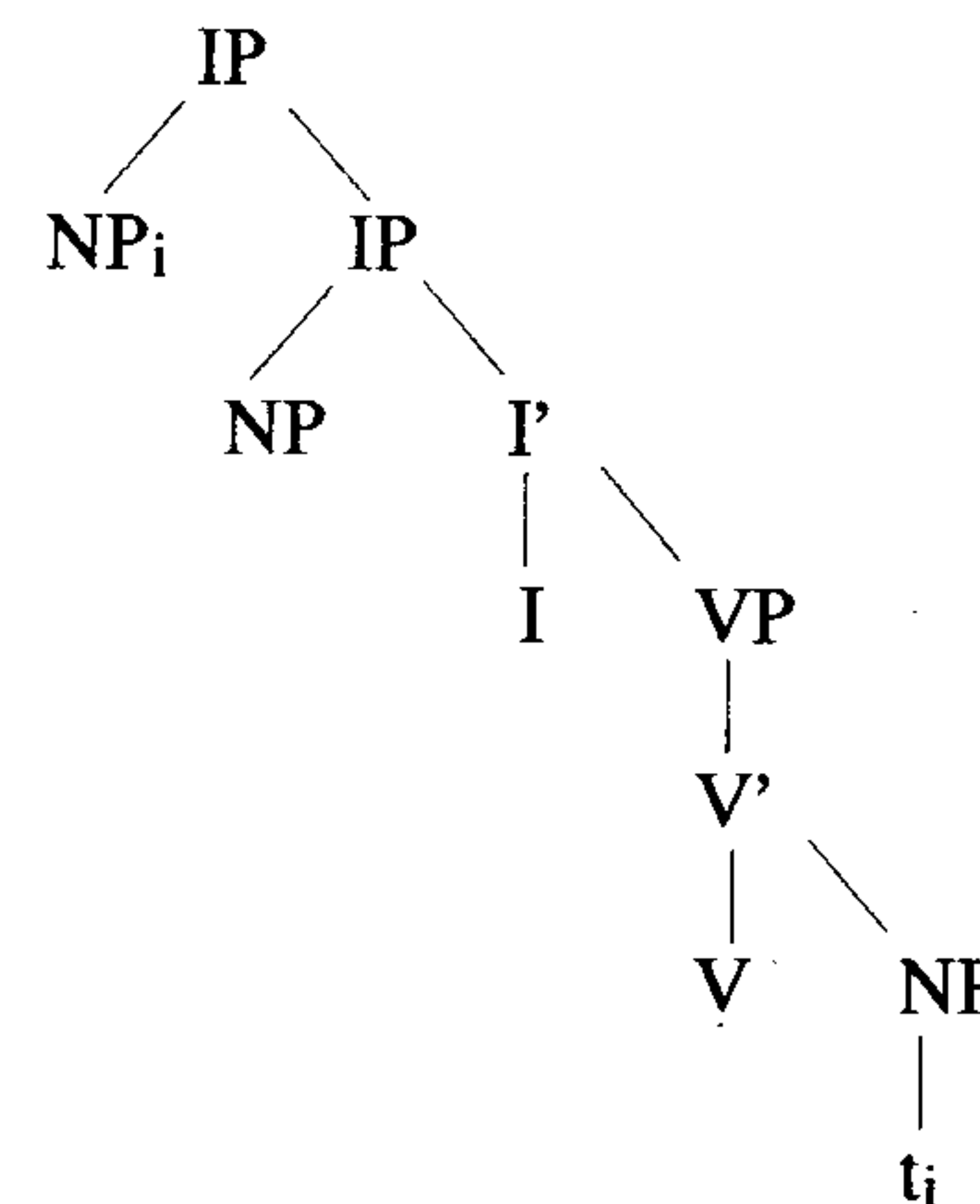


(67) [ Janka [ pro czytałam [ książkę t<sub>i</sub>]]]  
 S S NP  
 John's<sub>i</sub> (I) read [ t<sub>i</sub> book]  
 NP

(68) [ Jana<sub>i</sub> [ Marysia uderzyła t<sub>i</sub>]]  
 S S  
 John<sub>i</sub> Mary hit t<sub>i</sub>

(69) [o Janku<sub>i</sub> [ pro usłyszałem [ opowiadanie t<sub>i</sub>]]]<sup>10</sup>  
 S S NP  
 about John<sub>i</sub> (I) heard [a story t<sub>i</sub>]  
 NP

For example in (68) the requirements of the generalized binding theory are perfectly met. If the direct object *Jana* moves to an S(IP) adjoined position, its trace is correctly  $\bar{A}$ -bound, for in its new position the object both c-commands the trace and is coindexed with it.



Now let us turn our attention to the phenomenon of subject movement which is almost as frequent in Polish as object scrambling. All the cases of syntactic movement we have considered so far have been leftward movements but the subject NP is shifted rightward. Although it is not the direction of movement that matters but c-command, it still has serious consequences for the relation of c-command. Subject movement is exemplified in (70) and (71):

(70) t<sub>i</sub> przyszedł Tomek;  
 t<sub>i</sub> came Tom<sub>i</sub>

(71) a. t<sub>i</sub> dała jabłko Jurkowi Marysia;  
 t<sub>i</sub> gave an apple to George Mary<sub>i</sub>

<sup>10</sup> We shall assume that an index of every PP is that of its NP complement:  
 [P -NP<sub>i</sub>] → PP<sub>i</sub>



- b.  $t_i$  jabłko Jurkowi dała Marysia;  
 $t_i$  an apple to George gave Mary;  
c.  $t_i$  Jurkowi jabłko dała Marysia;  
 $t_i$  to George an apple gave Mary;  
d. [ Jurkowij [  $t_i$  dała Marysia jabłko  $t_j$  ]]  
S S  
to George  $t_i$  gave Mary  $t_j$  an apple  
e.  $t_i$  dała Marysia; Jurkowi jabłko

For the analysis of these examples we could postulate two choices:

- A. Their word order is base generated.  
B. It is a result of the application of scrambling rules, unrestrained by the theory of A-binding but subject to some other conditions, probably the X-binding theory.

Proposition A. is very difficult to maintain for a few reasons. First the statistical data quoted by Willim shows that the prevailing word order in affirmative sentences in Polish carrying new information is SVO- subject-verb-object. In cases where case endings for two nouns in the subject and the object positions are identical, the word order is strictly SVO:

- (72) Tramwaj wyprzedził autobus.  
A tram overtook a bus.

Proposition A. seems implausible due to the violation of the Case theory, namely the impossibility of Nominative Case assignment to the postverbal subject "Tomek". However a mechanism of Nominative case assignments in such structures was suggested by Aoun and Bouchard for Italian:

- (73)  $t_i$  verra Giovanni  
 $t_i$  will come Giovanni

They assume that in such structures INFL lowers to VP and percolates to V. Following the INFL lowering the postverbal subject will still be governed by INFL/AGR and receive its Nominative case. This suggestion salvages (73) and (70) but fails to salvage (71a.) because of the lack of adjacency of the case assigner ( V plus the lowered INFL) and the case assignee - the subject in the final position. At this point though we could claim that adjacency is not required for Case assignment in Polish and supplement the procedure of abstract Case assignment with the procedure of Case checking suggested by Tajsner for Polish and other highly inflected languages<sup>11</sup>.

Bouchard (1983) analyses more interesting cases of (74) in Italian:

- (74) pro [ [ V NP ] NP ]  
VP V'

<sup>11</sup> In his yet unpublished Ph. D. dissertation P. Tajsner analyses Case assignment in Polish as a procedure consisting in Case checking, not contingent upon adjacency of the Case assigner and the Case assignee.

of which a Polish counterpart could be:

- (75) pro [ [ zjadł jabłko ] JANEK ]  
VP V'  
ate an apple John

with heavy focal stresses on *Janek*. In Bouchard's analysis these structures have a base generated pro in the subject position and the lexical subject adjoined to VP. The interpretation of both (73) and (75) relies on a combination of three factors: the Nominative case assignment which can be delayed till LF and performed by an amalgamated VP+INFL complex following INFL lowering to VP and its percolation to V<sup>0</sup>, rich INFL typical of highly inflected languages and the property of Case checking at LF. Consequently the subject position is not an argument position internal to VP and therefore the Nominative case assignment does not take place under Theta-government. Italian allows for it to be delayed until LF if the subject is a pro, i.e. non lexical. This delay beyond the level of S-structure has crucial consequences, for Case is regarded as a feature *visible* to the phonological component of grammar and any element with the feature +Case at S-structure must be provided with some lexical matrix. Thus if Nominative Case can be assigned to non lexical subject positions at LF, such subjects could exemplify two allegedly incompatible characteristics: +Case, -lexical. We shall return to this question in connection with the rightward movement of the subject in Polish.

Generally speaking, the main advantage of proposition A. is the lack of syntactic movement, and consequently any traces, which precludes the application of the binding theory in its wider formulation.

However, by the same token proposition A. would produce the most obvious violations of the binding theory in the case of overt anaphors.

Consider (76) and (77):

- (76) Siebie<sub>i</sub> dziś rano pro<sub>i</sub> skaleczyłem nożem  
myself<sub>i</sub> this morning (I)<sub>i</sub> cut with a knife  
(77) \*Mnie<sub>i</sub> dziś rano pro<sub>i</sub> skaleczyłem nożem  
Me<sub>i</sub> this morning (I)<sub>i</sub> cut with a knife

If we decided to choose A. we would have to reformulate the binding principles so that they were able to distinguish between the grammatical (76), with emphasis on *siebie*, and ungrammatical (77). Besides, both (76) and (77) would violate the Projection Principle operating at the level of DS which requires that:

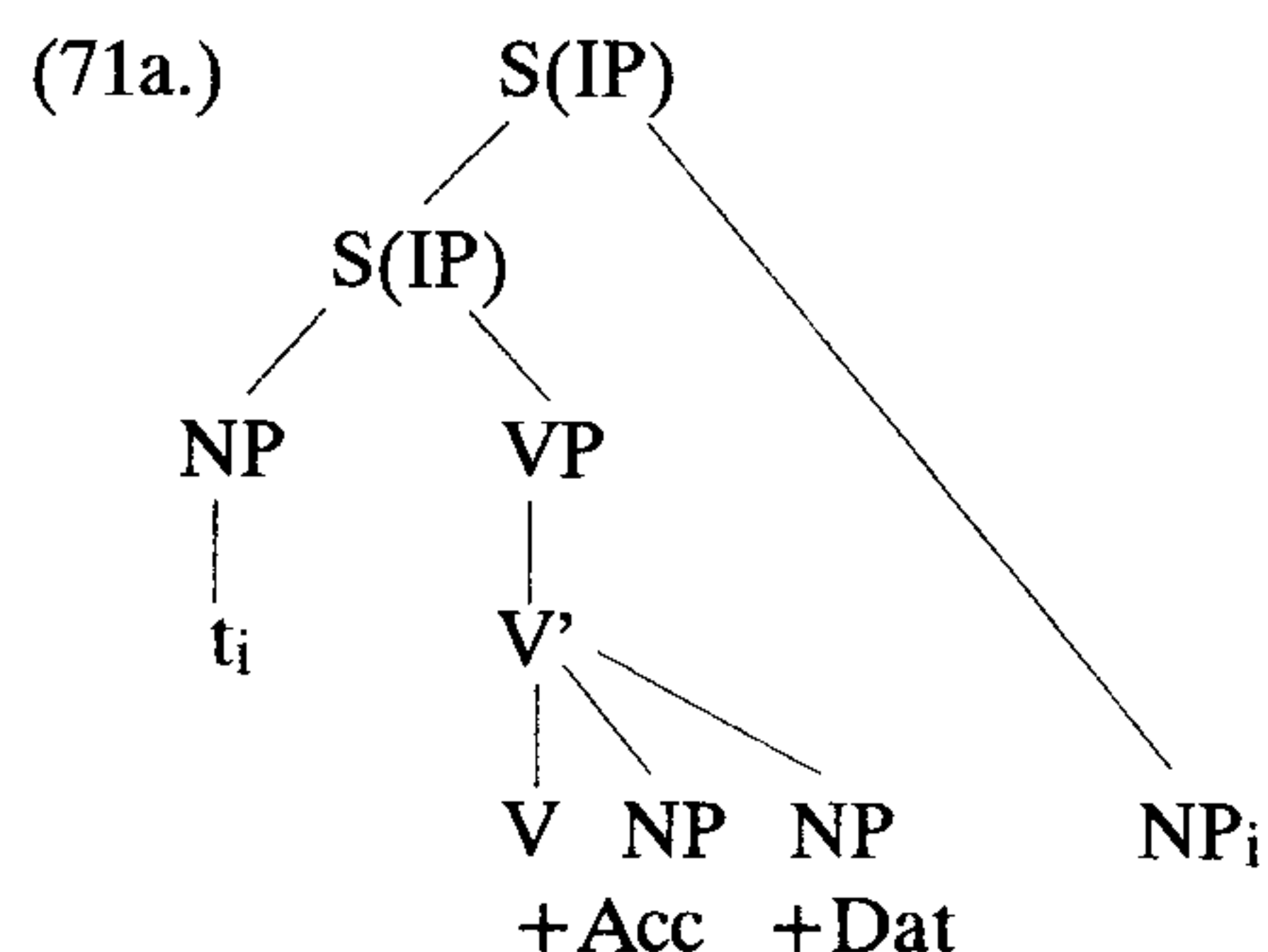
- (78) Representations at each syntactic level (i.e. LF and D and S structure) are projected from the lexicon in that they observe the subcategorisation properties of lexical items. (LGB p.29)

In our example the verb is subcategorised as:

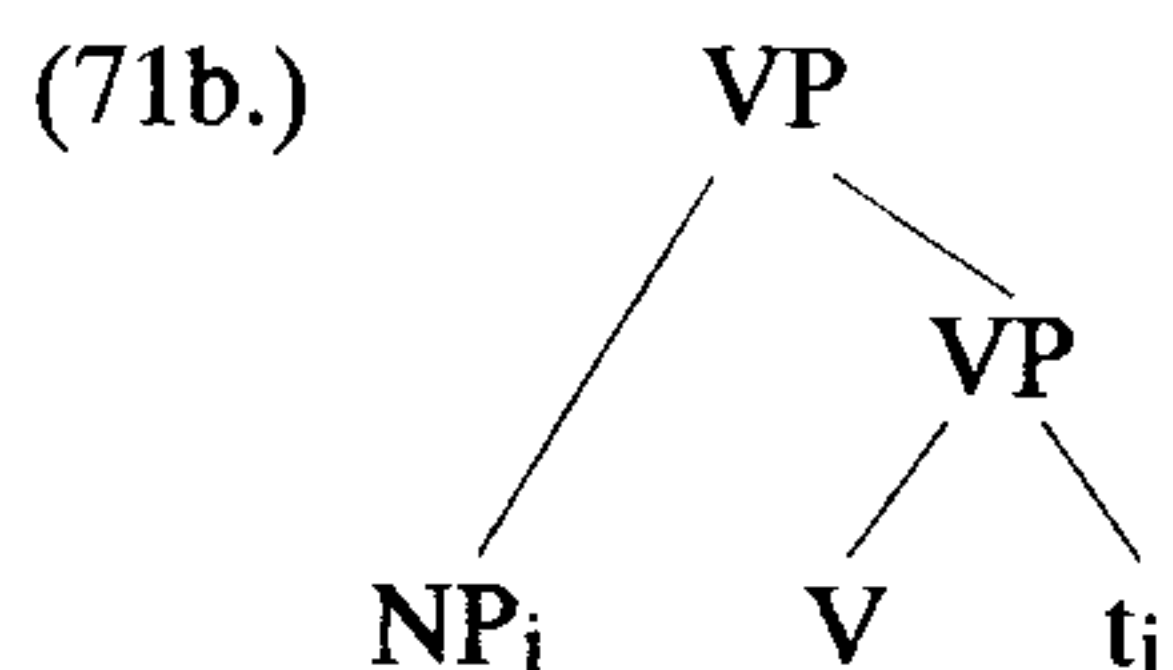
- skaleczyć, V +[ \_ NP ( NP ) ]  
+Instr

Thus in their present form at DS (77) and (76) would be incongruous with the subcategorisation framework of their predicate and fail to satisfy the Projection Principle.

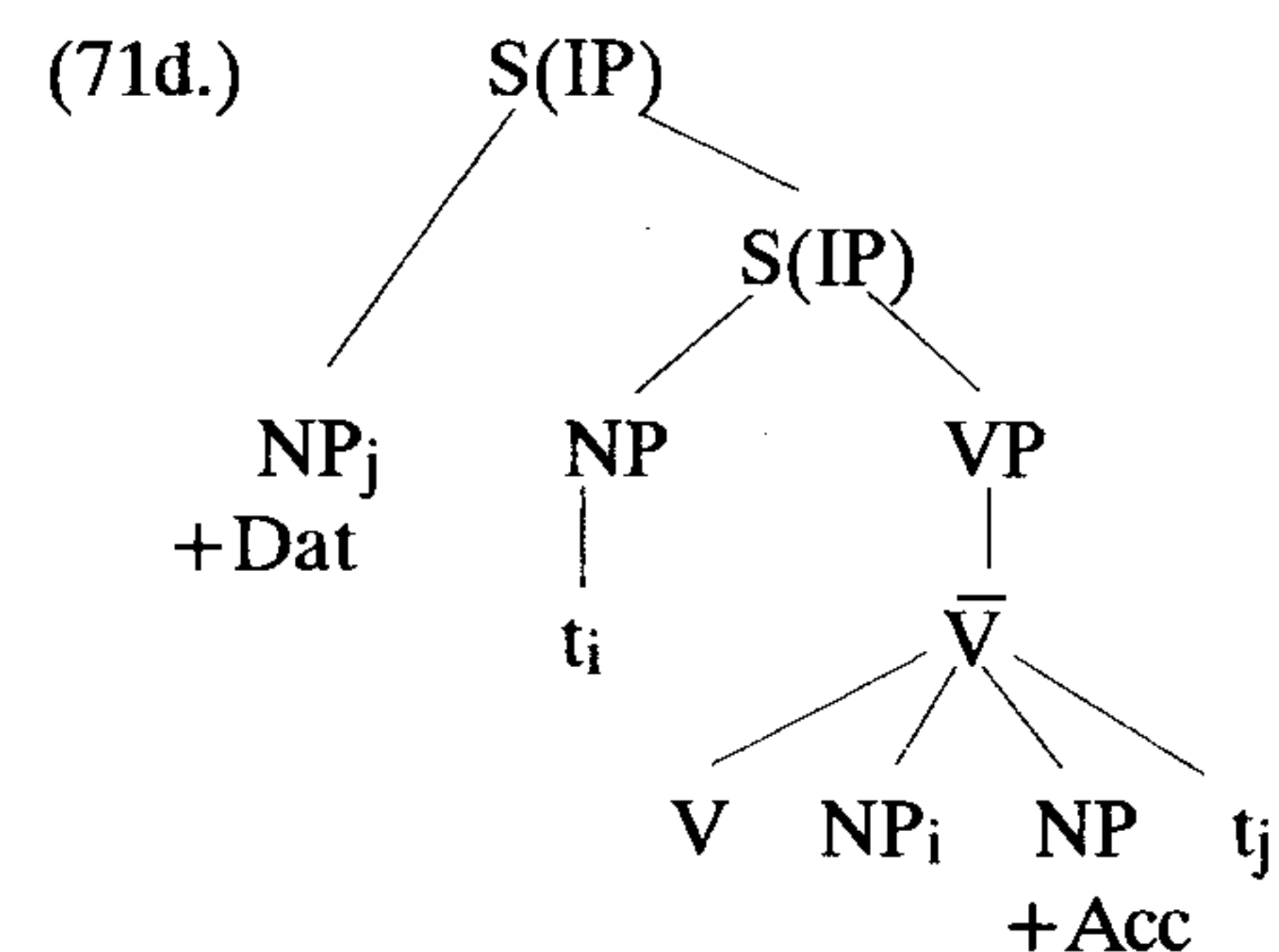
Proposition B. then seems much more plausible but advocating the X-binding approach to topicalisation/scrambling in Polish we still have to overcome a serious difficulty. While the topicalisation/scrambling of objects meets the requirements of the X-binding theory because object traces are always c-commanded by their antecedents in IP adjoined positions, the rightward movement of the subject NP is more problematic. In the phrase markers showing the VOS order of constituents in (71a.b.c.) the subject can be adjoined to IP, c-command its trace in the subject position and thus bind it, as it is for example in:



This is our first strategy of binding of the trace in the subject position by a displaced lexical subject. However the process of adjunction in object and subject scrambling does not uniformly constitute adjunction to IP. The surface structure word order of verb-object-subject indicates that scrambling consists also of VP adjunction. In the case object movement VP adjunction has exactly the same consequences for the relation of binding as IP adjunction: the moved element in its target position will always c-command its trace:



But for subject NPs in verb-object-subject structures the relation of c-command does not hold although they are perfectly grammatical and frequently used. In (71d.) the subject NP is evidently adjoined to  $\bar{V}$  or VP and as a maximal projection VP does not dominate the subject NP position and blocks c-command:



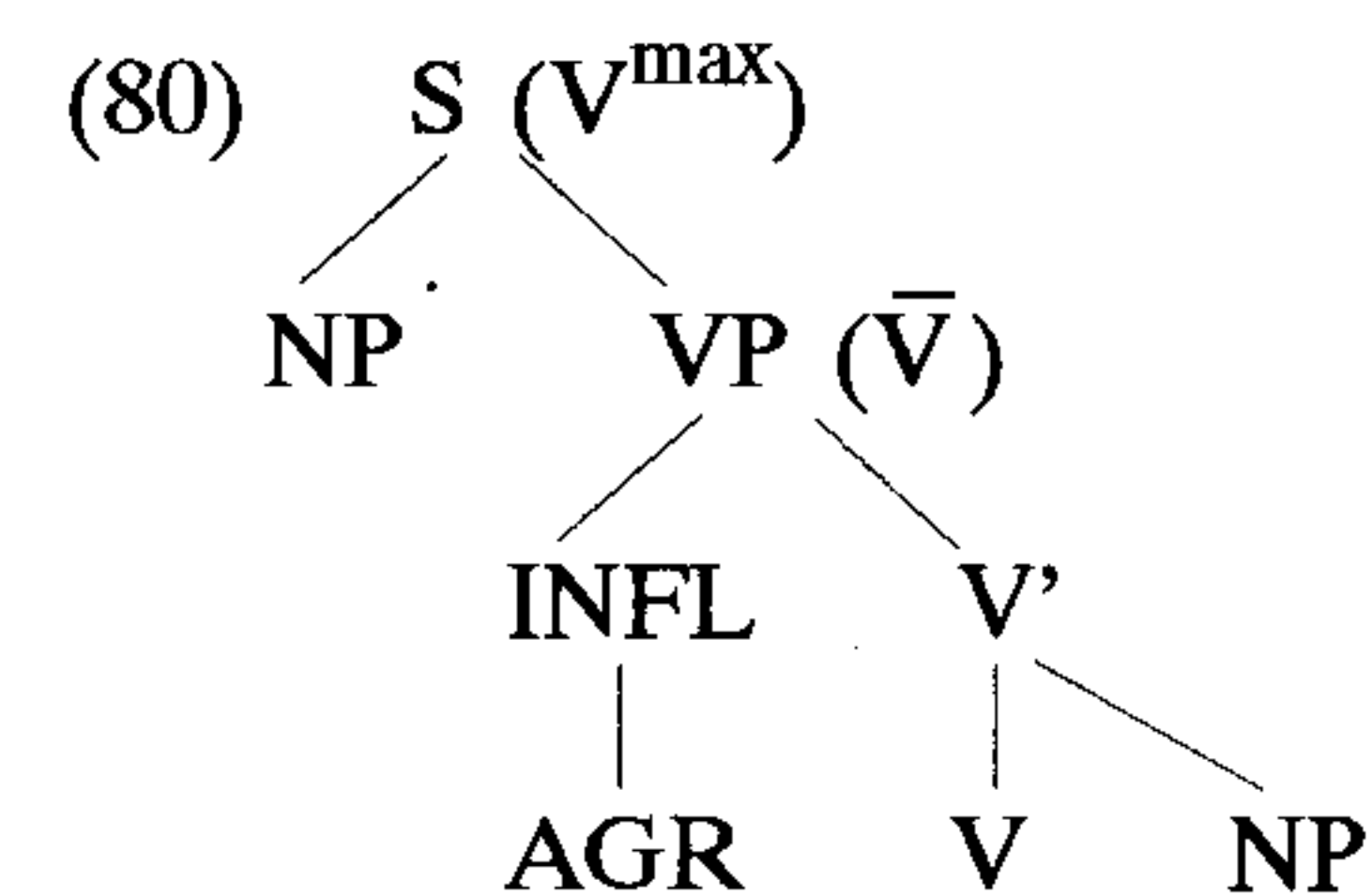
A rather evasive solution to this problem of lack of c-command was suggested by Chomsky and Manzini for "picture NPs" such as:

(79) [ pictures of each other<sub>i</sub> ] would please the boys<sub>i</sub>

(Manzini 1983, p. 430)

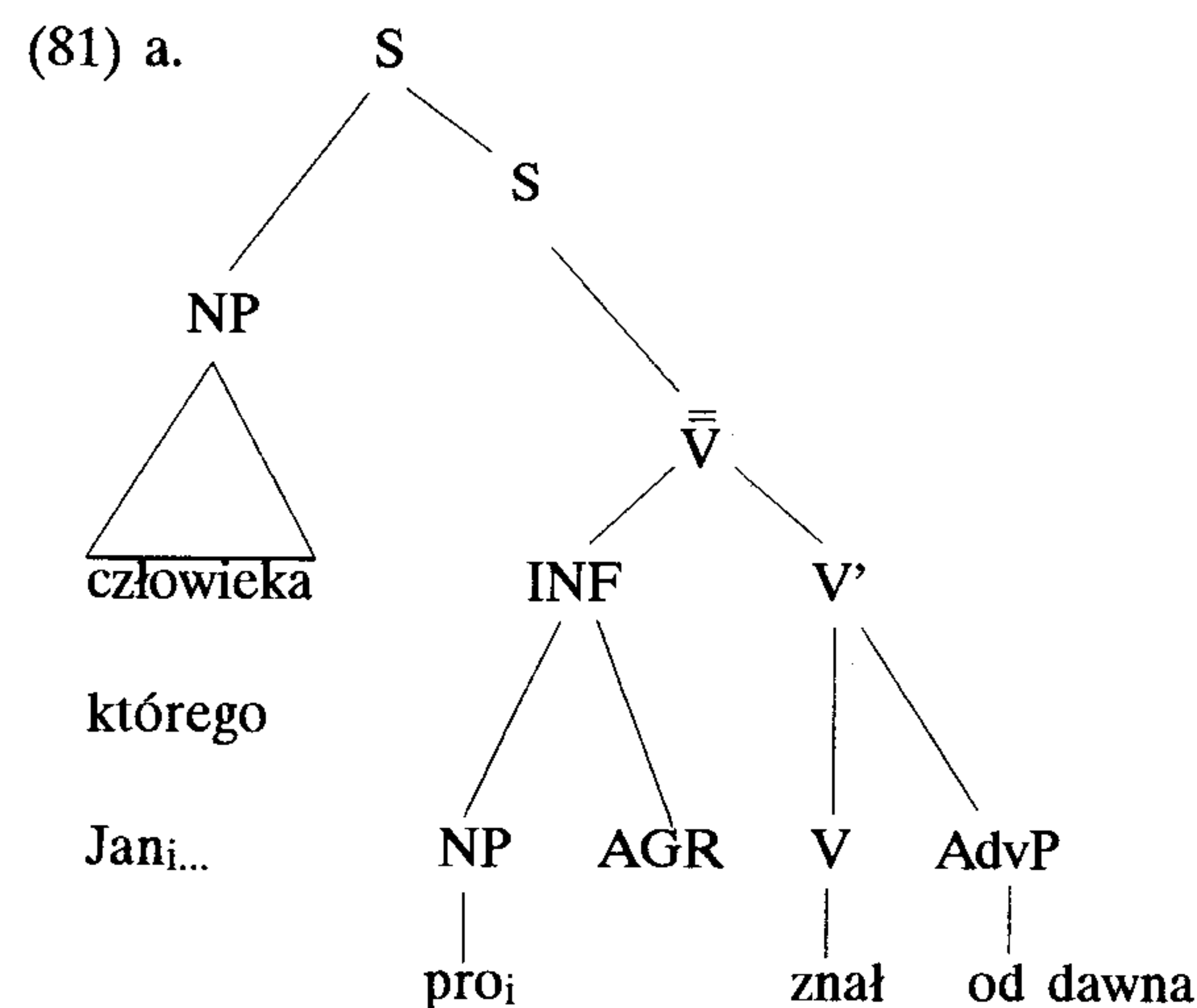
where, as they say, in marginal cases of anaphor binding c-command is not required and does not hold; coindexing of the anaphor and its binder suffices to secure binding.

An alternative solution to this question can be proposed, following in principle Bouchard's account of the Nominative case assigned pro in the subject position in Italian. In his approach INFL is not an independent node, the head of S, but  $S = V^{max}$  and the basic sentence structure has the form of (80):

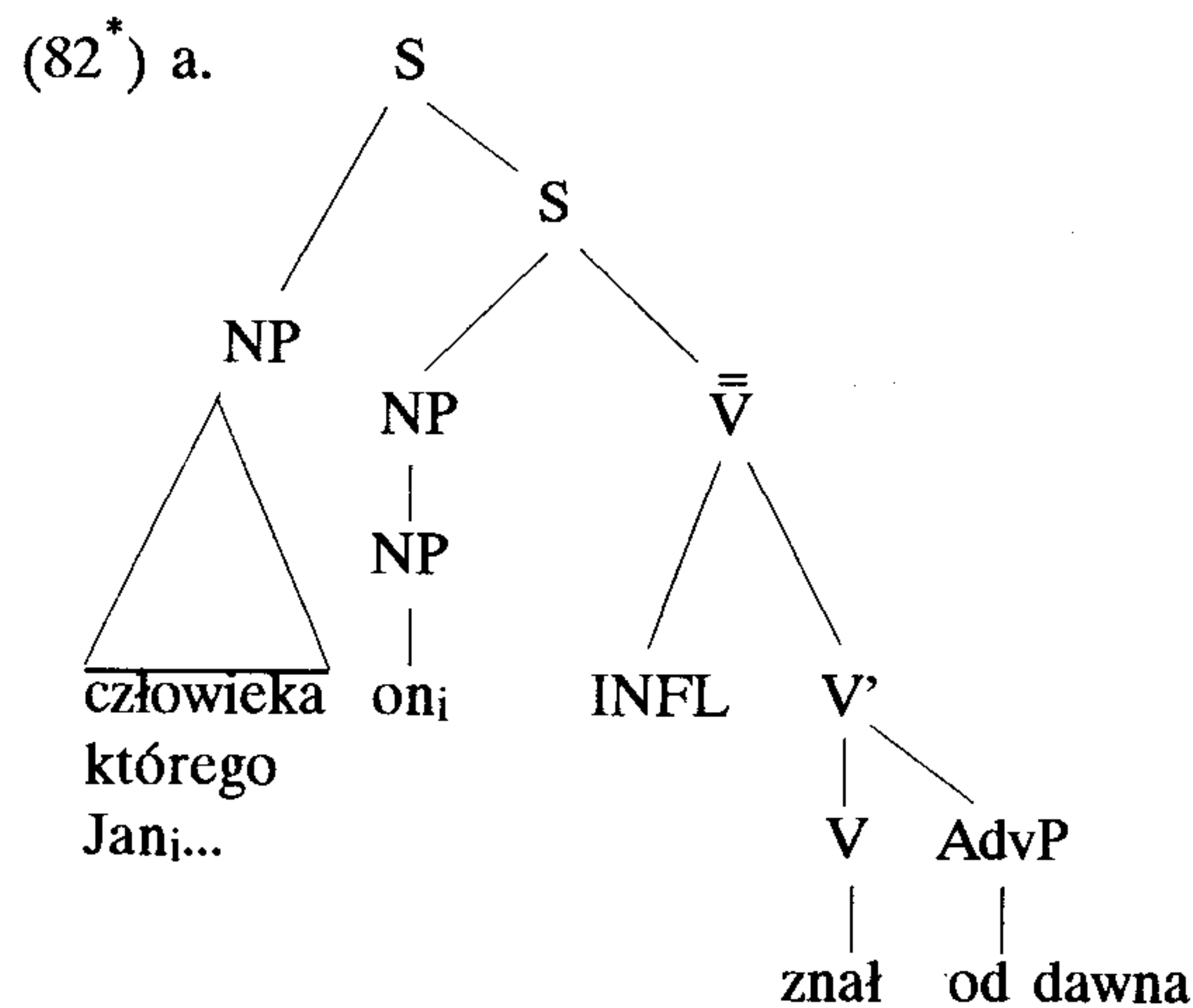


The rich inflectional system "of a language justifying the placement of pro in the subject position requires that it be locally determined by AGR for matching of features. This local determination of pro by AGR can be understood as government of pro by AGR" (Chomsky 1982:85) which in (80) is blocked by an INFL node which is a barrier. But as Tajsner (1990) observes if pro is lowered under INFL node and becomes a sister of AGR, the relation of government can hold and pro is close enough to AGR to receive necessary features. This lowering also explains the lack of Principle C violations with pro subjects in Polish in (81):





b. Człowieka, którego Jan spotkał wczoraj, znał od dawna  
as opposed to (82):



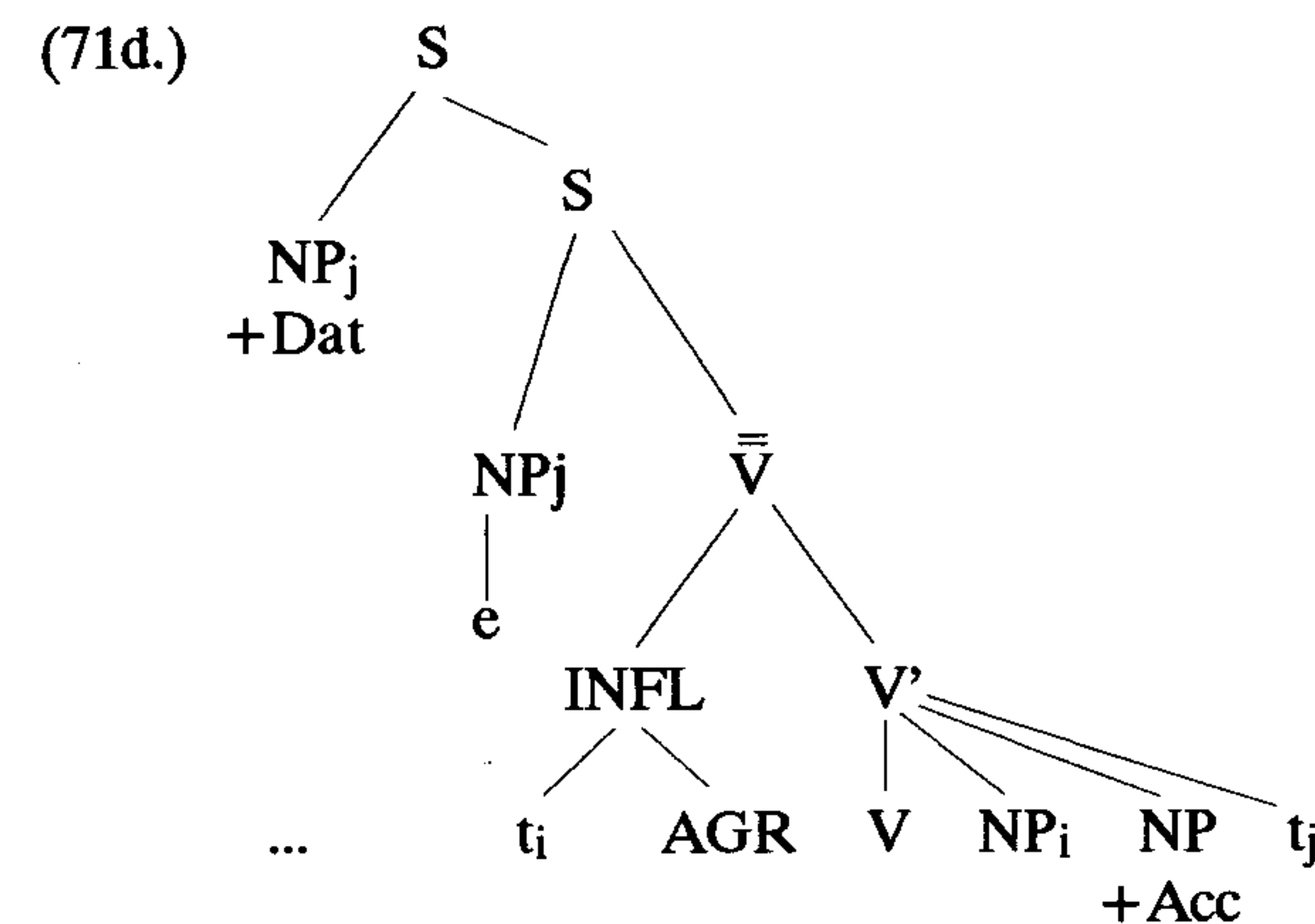
b\* .Człowieka, którego Jan spotkał wczoraj, on znał od dawna

We can see that *pro* in (81) does not c-command the adjoined NP whereas a pronoun in the subject position under S does and causes a Principle C violation.

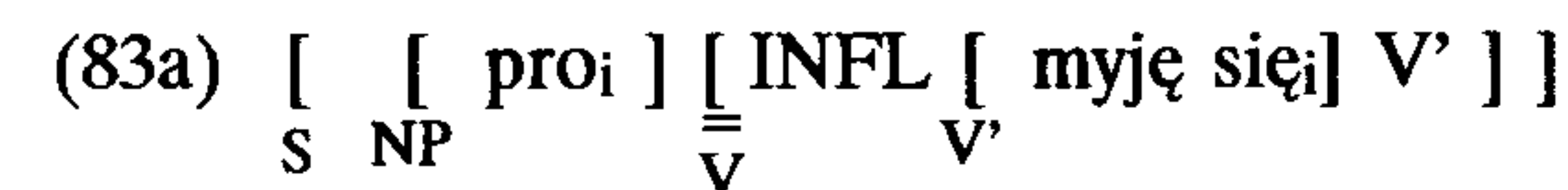
Now we would like to claim that this lowering of *pro* from (83) to (84):



concerns not only *pro* but also any EC in the subject position, namely both *pro* and the trace left behind by a lexical subject scrambled to the right under VP or V'. Thus again (71d.) could have the form:



where  $NP_i$  (*e*) restructures into  $t_i$ ,  $NP_i$  c-commands its trace through  $\bar{V}$  which satisfies Principle A of the X-binding theory and the ECP in two ways: *pro* is properly governed by AGR and a trace of a displaced element is antecedent-governed by the element adjoined to VP or V'. This twofold character of the subject Empty Category within INFL should not be viewed as an inconsistency, for it is in line with the proposals put forward by Bouchard for whom there are no major structural differences among ECs. Conversely, various functions of the EC are determined by an interplay of other factors such as the Case theory and Theta-theory. In our case the empty category dominated by INFL is interpreted as *pro* if no lexical constituent coindexed with this position is postposed under VP or V'. This distinction however must be made precise. We would like to be able to account for (83a.) in which the reflexive pronoun *się* must be bound by its antecedent *pro*:



(I)<sub>i</sub> wash myself<sub>i</sub>

If the lowering of *pro* under INFL were to take place prior to checking the relation of anaphor binding, the prospective binder, as (84a.) shows, would not have the anaphor in its c-command domain, with the INFL node interfering:



But the analysis assuming the lowering of an EC in the subject position in Polish can be maintained provided the lowering occurs not at S-structure but later, up to LF, thus allowing for:

- proper interpretation and identification of *pro* which must be close enough to AGR at an interpretive level of grammar; and
- proper binding of *się* as an argument at S-structure.

Thus generally speaking we can identify two strategies of binding of a trace of a lexical subject displaced by scrambling to the right of the phrase marker: if adjunction to IP is available the Subject position is always c-commanded, if the subject is displaced under VP or V', the trace restructures under the INFL node and allows c-command via VP.

As a process, topicalisation/scrambling does not seem to be completely homogenous. For example (41) and (43) differ from other examples in that in the derivation of these structures topicalisation/scrambling is essential whereas in other examples their pre-topicalisation stages are as grammatical as their surface structures. The cases of (41) and (43) could be explained by the status Principle C of the binding theory. If we assume that this principle operates at the level of S-structure we can understand the obligatoriness of topicalisation/scrambling in (41) and (43). As for other cases of A-binding of Wh-traces of their operators and topicalisation/scrambling, we shall assume that it is checked at the level of LF. Thus X-binding operates at both S and LF levels of grammar, with A-binding holding at LF and at S-structure if Principle C is threatened.

#### 4. Concluding remarks.

As we have seen the *generalized* theory of X-binding of Aoun and Bouchard provides some useful insights into the phenomenon of topicalisation/scrambling in Polish. The rules of the X-binding theory correctly describe the (binding) relation holding between elements displaced by scrambling and their traces within the same clause and in the case of long distance extraction from the object position.

The analysis of *żeby*-clauses and infinitival clauses by means of the COMP Indexing Rule and the index chain provide correct predictions for extractions from the object position and interpret these cases of movement out of S(IP) and  $\bar{S}$ (CP) boundaries unaccounted for by Subjacency.

With an important modification the X-binding theory accounts for Wh-extraction and topicalisation/scrambling from the subject position. The leftward movement from the subject position in *żeby*-clauses produces ambiguous effects (see note 5), sometimes contrary to the predictions made by the assumed placement of *żeby*. Within the clause the rightward movement from the subject position causes problems for the relation of c-command for the trace immediately dominated by S(IP), thus in order to cover these cases the relation of c-command has to be loosened or reinterpreted along the lines suggested by Bouchard for the placement of *pro* at LF.

#### REFERENCES

- Aoun, J. 1985. *A grammar of anaphora*. Cambridge, Mass.: MIT Press.  
 Aoun, J. and Sportiche, D. 1981. "On the Formal Theory of Government". Paper read at the 1981 GLOW Conference, Göttingen.

- Bouchard, D. 1983. *On the content of empty categories*. Dordrecht: Foris Publications.  
 Chomsky, N. 1981. *Lectures on government and binding*. Dordrecht: Foris Publications.  
 Chomsky, N. 1982. *Some concepts and consequences of the theory of government and binding*. Cambridge, Mass.: MIT press.  
 Chomsky, N. 1985. *Knowledge of language: its nature, origin and use*. New York: Praeger.  
 Chomsky, N. 1986. *Barriers*. Cambridge, Mass.: MIT Press.  
 Lasnik, H. and Saito, M. 1984. "On the nature of proper government". *Linguistic Inquiry* 15. 235-89.  
 Pesetsky, D. 1982. *Paths and Categories*. Doctoral Dissertation, MIT.  
 Saito, M. and Hoji, H. 1983. "Weak Crossover and Move Alpha in Japanese". *Natural Language and Linguistics Theory*.  
 Stowell, T. 1981. *Origin of Phrase Structure*. Doctoral Dissertation, MIT.  
 Tajsner, P. 1990a. "Scrambling and the Polish word order". *PSiCL* 25. 43-57.  
 Tajsner, P. 1990b. *Case marking in English and Polish: a government and binding study*. Unpublished doctoral dissertation. School of English, Adam Mickiewicz University, Poznań.  
 Willim, E. 1986. *Some aspects of word order in English and Polish. A Government and Binding study*. Unpublished doctoral dissertation. Jagiellonian University, Kraków.  
 Zabrocki, T. 1981. *Lexical rules of semantic interpretation*. Poznań: Wydawnictwo Naukowe Uniwersytetu im. A. Mickiewicza.  
 Zabrocki, T. 1989. "A surface structure constraint and its consequence for a positional and inflectional language". *Linguistic and Literary Studies in Eastern Europe* 30. 85-111.