

Chapter 3

Control

1. INTRODUCTION*

Ever since the program of fully explicit grammars was initiated in the early sixties, control has been a serious challenge for the explanatory adequacy of the theory of grammar. In the 80's, control was partially reduced to Binding theory: PRO behaves as an anaphor which has the matrix clause as its governing category. However, control is different from Binding in that there seem to be semantic restrictions on controller choice which are absent for anaphoric Binding. These semantic restrictions have long been viewed as part of a poorly understood control module. In this chapter, it will be argued that there is no separate module for control ('control theory') in the grammar. Instead, control results from the modular interaction of independently motivated principles and modules of the grammar: Binding theory, lexical event structure, and government. The idea is developed that control is largely determined by the interaction between Binding theory on the one hand, and an explicit theory of semantic selection by the matrix V° which properly governs the infinitival C° on the other. I claim that the selectional mechanisms which determine the temporal interpretation of an infinitive also determine control of this infinitive. It is argued that the temporally [- realized] infinitival morphology in C° is identified and coindexed with temporally [- realized] subevents lexically represented in the aspectual subevent structure of the matrix V° . The subevent coindexed with C° determines the temporal interpretation of the infinitive. More importantly, the lexical coindexation of C° with the [- realized] subevent in V° severely restricts the possible Binding antecedents of anaphoric PRO which is coindexed with the infinitival C° - T° temporal morphemes. PRO can only be bound by arguments in the matrix clause which are lexically represented in the subevent with which C° is lexically coindexed. The explanatory adequacy of this idea will be illustrated by the analysis of the event structures defining various coherent semantic classes of control verbs.

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2. A MODULAR ANALYSIS OF CONTROL OR A CONTROL MODULE?

Most proposals concerning the syntax of control in the last decade have concentrated on the way control is related to Binding (Manzini 1983, Koster 1984, Bouchard 1985, Borer 1989, Vanden Wyngaerd 1990, 1994). Simplifying somewhat, this discussion has led to the insight that the infinitival subject PRO or the infinitival AGR_S^o (Borer 1989) is basically anaphoric in nature, since the controller is to be found in the local domain in which the controlled infinitive is a complement.¹

- (1) Pat_k claims that Kim_i promised Sandy_j PRO_{i/*j/*k/*arb} to do the dishes

These proposals partially reduce control theory to Binding. This insight is a necessary, but nevertheless insufficient step towards a full understanding of obligatory control in infinitival complements. If Binding alone were responsible for control, any three-argument verb with two arguments besides the controlled sentential complement should allow PRO to be bound by either argument in the matrix clause. This is not the case: the subjects of verbs expressing influence such as *force* or verbs of ‘judgment’ such as *accuse* or *praise* cannot function as controllers:

- (2) a. Kim_i forced Sandy_j PRO_{*i/j/*arb} to do the dishes
b. Kim_i praised Sandy_j PRO_{*i/j/*arb} for doing the dishes

As observed by Chomsky & Lasnik (1991), control is very different in this respect from Binding. Control of PRO in (2) seems to be provided by a specifically designated argument in its governing category. Binding of an anaphor does not face such a restriction: in (3), even though Binding is obligatory, the anaphor can be ‘freely’ bound by any argument in its governing category.

- (3) Kim_i talked to Sandy_j about herself_{i/j}

Chomsky & Lasnik (1991:72--73) view this thematic uniqueness restriction on the antecedent for PRO as an argument in favor of a control module in the theory of grammar.

However, ‘free’ control of PRO by any argument in the matrix clause is attested. Obligatory Binding/ control of PRO by any argument of the matrix clause is restricted to some verbs of transfer, sometimes involving more delicate patterns of control shifts (Ruzicka 1983, Larson 1990). Verbs of the *propose*, *offer*, *suggest* class allow for free control (4), verbs such as *promise* and *guarantee* involve preferential subject control (5ab), and verbs of asking involve preferential object control (5cd):

- (4) Kim_i offered Sandy_j PRO_{i/j/i+j/*arb} to do the dishes

- (5)
- a. Kim_i promised Sandy_j PRO_{i/*j/*arb} to do the dishes
 - b. Kim_i promised Sandy_j PRO*_{i/j/*arb} to be allowed to do the dishes
 - c. Sandy_i asked Kim_j PRO*_{i/j/*arb} to do the dishes
 - d. Sandy_i asked Kim_j PRO_{i/*j/*arb} to be allowed to do the dishes

‘Free’ control of PRO in the matrix clause of (4) then is on a par with ‘free’ Binding of the anaphor in (3). It is clear that lexical properties of the matrix predicates somehow determine why the subject in (4--5) is available for control, but not in (2). More precisely, the set of possible controllers in (2) is restricted to the object, but in (4--5) it includes both the subject and the object. This much is admitted by Manzini (1983), who shoves these problems under the lexical rug, a temporarily justified but ultimately unsatisfactory solution. Note that purely thematic accounts of control along the lines of Jackendoff (1972, 1987) would be unable to account for the variation in (4--5): the thematic ‘grid’ of the class of verbs such as *offer* (*propose*, *suggest*) (2) and the class of *promise*, *guarantee* (5ab) involve exactly the same Source - Theme - Goal structure, but the control properties exemplified by the verbs in these classes are different. Other traditional solutions include registering these control properties as idiosyncratic features of the matrix verb (Rosenbaum 1967, Chomsky 1981), or as purely pragmatically determined properties (Postal 1970, Sag & Pollard 1991). Both types of solutions to the control problem are ultimately circular: *promise* is a subject control verb because it belongs to the class of events expressing a promise. We may conclude that there is a lexical residue of control theory which is unreducible to Binding and which needs to be explained by independently motivated semantic factors.

It can of course be claimed that these semantic factors are the object of a separate module in the grammar, control theory. However, in a modular framework, the minimal hypothesis would be to assume that Binding of PRO in the matrix clause is somehow further constrained by these lexical properties. How can such a modular analysis of control be achieved? It is the purpose of this contribution to solve this puzzle. The problem can be subdivided into four basic questions:

- (6)
- i. What is the semantic representation allowing for an accurate distinction between the different classes of control verbs? (the force type class, the offer type class, the promise type class, the ask type class)
 - ii. What properties of this semantic representation determine control?
 - iii. How do these properties determine control given standard assumptions about semantic selection of C° by V° under proper government?
 - iv. How can these properties be integrated in a modular way with the insight that PRO is an anaphor subject to Binding theory? How does proper government of C° further restrict Binding of PRO?

These questions will be treated in good order. With respect to (6i), I would like to claim that the event structure of control verbs is the semantic representation which is relevant for distinguishing control verb classes (§ 3 and 6). With respect to question (6ii), it will be proposed that the aspectual subevents which can be defined in terms of the temporal feature

[- realized] are involved in defining control. These [- realized] subevents of the matrix V° determine control (6iii) via semantic selection of the infinitival C° . Since the infinitival C° can be defined in terms of the feature [- realized] (Stowell 1981), there is a lexical identification between the [- realized] aspectual subevent properties in V° and the temporally [- realized] properties of C° (§ 4.). This temporal identification of the infinitival C° in V° determines the temporal interpretation of the infinitive. It will be shown that this temporal interpretation of the infinitive by the matrix control V° effectively reduces the number of Binding possibilities for PRO (§ 5). Control of the infinitival subject is determined by the temporal interpretation of the infinitive. In this way, the lexical residue of control theory can be derived. As a result, a truly modular explanation of control is reached, and the need for a control module in the grammar is eliminated. In § 6, an analysis of the event structure of the control verb classes in (2--5) will illustrate how their control properties can be derived.

3. FINE-TUNING LEXICAL SEMANTICS: EVENT STRUCTURE AND CONTROL

It is claimed here that the semantic properties determining controllerhood are to be found in the aspectual event structure of each class of control verbs. The event described by a particular verb or class of verbs can be represented as developing through time. In this section, I would like to briefly introduce Pustejovsky's (1988) framework which will be used to represent the event structure of semantic verb classes, though augmented with some additional descriptive devices.

Pustejovsky (1988) distinguishes three event- types \square States are of the type $[S e]_S$, Processes are of the type $[p e_1 \dots e_n]_P$, and Transitions are of the type $[T \square_1 \dots \square_n]_T$. A State is represented as an event without internal development. Processes contain a undetermined succession of subevents translating a progressive change through time. Transitions contain two variable event- types, and their structure allows for the representation of the change of one event- type to another. They correspond to Vendler's (1967) accomplishments and achievements. These event- types are allow for complex compositional structures in which thematic roles can be expressed on the events and subevents. Importantly then, thematic roles in this framework are not simply an unordered list or 'theta- grid' of thematic role labels as for e.g. Stowell (1981), but they are ordered and embedded in the temporal development of the event. Some concrete examples may make this compositional framework for *Aktionsarten* more transparent.

Verbs of creation are represented as Transitions consisting of two subevents, one of which is a Process expressing the incremental action of creating, and the other representing the state of what is created after the time of verbal action. The event structure of a 'creation' verb such as *build* can be represented as follows:

- (7) a. John built a house
 b. $[T [p e_1 \dots e_n]_P \text{ act } (John, x) e \text{ house } (x)]_T$ (= Pustejovsky 1988:(3))

In this representation, x is a variable representing the object being created, and e represents the subevents into which the event of building can be subdivided (Pustejovsky

(1988:25).² In plain English, (7b) states that the event of John building a house involves two subevents: the first subevent is a Process of building which starts at a moment e_1 and goes on until an undetermined moment e_n . This Process subevent is associated with a predicate expressing causation which is predicated of the subject *John*: the agent *John* exerts an action upon the object x which is being created. The second subevent translates a stative subevent at which the object x being created is identifiable as a house. This representation then translates the conceptual notion of ‘incremental creation’ (Dowty 1991) into aspectual subevent structure. Agentive properties are integrated in the aspectual event structure of verbs as predicates (*act*) attached to temporal subevents. In Pustejovsky’s (1988) terms, the external structure of a verb such as *build* is a Transition, whereas the internal structure of the verb consists of the combination of a Process and a State.

Some observations can be added to Pustejovsky’s (1988) representation which will prove useful for the discussion of control. Notice that both the Process and the State subevents are nonpunctual and in a sense ‘unrealized’ in (7): the ‘future’ State subevent does not have temporal boundaries delimiting the event. A Process only has a starting point e_1 . The Process event-type then also is ‘unrealized’ in the sense that it is undetermined with respect to a particular temporal point: a Process does not have an intrinsic endpoint. In (7b), it is the Transition structure which ‘stops’ the Process subevent, not the properties of the Process subevent itself. The State subevent in (7b) is also ‘unrealized’, since it takes place in an undetermined future with respect to the Process of building.

This representation also allows for a temporal analysis of ‘transfer’ verbs. Pustejovsky (1988) analyzes verbs such as *give* as a Transition consisting of two events, the punctual agentive State of transfer and the resulting nonpunctual, temporally undetermined State of possession. The asterisk represents the fact that the event structure is headed by the first event.

- (8) a. Mary gave the book to Bill
 b. $[T\ e_1^* \textit{act}(\textit{Mary}) \ \& \ \textit{move}(\textit{Mary}, \textit{book})\ e_{at}(\textit{book}, \textit{Bill})]_T$
 (= Pustejovsky 1988:(2a))

In the representation (8b), the first subevent states that at a punctual moment e_1 , the subject Mary is agentive and moves the book. The second subevent translates the implication that Bill comes into a State of possession of the book for a stretch of time that is undetermined with respect to the punctual moment at which the first subevent takes place. The external Transition structure of *give* translates the temporal relation of one subevent being linked to another on the time axis. Notice that the subevent e_1 is punctual. From a temporal point of view, e represents event types that can be true at a specific, punctual, moment (e_1), at an undetermined, ‘unrealized’, moment in the future (e_{house} in (7b)), or during an undetermined, ‘unrealized’, time period (e_{at} in (8b)). It is implicit in Pustejovsky’s (1988)

² There may be other formalisms than Pustejovsky’s (1988) to express these insights, but the formalism itself is not what is under discussion here. The aim of this chapter is to show how the internal temporal structure of verbs is related to control, independently of the exact formal representation of their event structure.

framework that the event- type e can be further subdivided by the $[\pm \text{ realized}]$ feature. Punctual ‘realized’ States can be represented by numerical indexes (e_1). ‘Unrealized’ States may be represented without an index by Pustejovsky (1988) if the subevent extends over a (future) time- period without temporal boundaries, as in (8b), and by e_n if the Stative subevent takes place at an undetermined moment (cf. (7b)).

Beyond the representational problem, it is crucial to define more precisely the notion of ‘unrealized’ subevent. ‘Unrealized’ (sub)events can be defined by their relative independence with respect to the temporal development of the event. This temporal independence of the subevent with respect to the temporal development of the event can be realized in two ways. First of all, a (sub)event can be independent of the time axis because it not delimited with respect to past or future relatively to the time set by the temporal morpheme it is linked to. These subevents can also be represented as e_n . Examples of such a nonpunctual, ‘temporally unrealized’ event would be the Stative verbs *deserve*, *sit*, *regret*, *love* and the like. A Stative verb in a present tense presupposes that the event did not start nor end with that present tense: on the contrary, the event is presented as extending before and after the event time of the temporal morpheme.³ In the same way, it will be shown later on that in the more complex Transition event structures, a subevent can be temporally independent with respect to past or future relatively to the subevent e_1 which is linked to the temporal morpheme.

There is a second way in which (sub) events may be temporally independent or ‘unrealized’ with respect to the temporal development of the event. It was already observed above that subevents can be temporally undetermined with respect to the future development of the event. These ‘unrealized’ (sub) events then are only partly independent from the temporal development of the event. This is the case for Process (sub)events as in (7b), which have no internal future boundary, but also for (sub)events which take place at an undetermined moment (7b) or time period (8b) in the future. The term ‘unrealized’ subevent here refers to a ‘possible future’ subevent, which can be represent as e_{n+1} . The term temporally ‘unrealized’ then can be defined as follows:

- (9) A (sub) event is temporally ‘unrealized’ ($[- \text{ realized}]$) iff (a) or (b):
- a. The (sub)event is not linked to a specific point on the time axis representing the temporal development of the verb; it is temporally undefined with respect to the past and future of the event time e_1 which is linked to the temporal morphemes in T° . This type of subevent is represented as e_n .
 - b. The (sub) event includes at least one point or period on the time axis that lies in the future with respect to the event time e_1 linked to the temporal morphemes in T° ; the (sub) event refers to a ‘possible future’, and is represented as e_{n+1} .

Both parts of the definition are of course conceptually related: the term temporally ‘unrealized’ refers to (sub)events that are *not* temporally realized on the past/ future time axis, and to ‘possible future’ (sub)events that are *not yet* temporally realized on the time axis.

³ This is not trivially true of all verbs. For Achievement verbs such as *arrive*, tense delimits the ‘lower bound’ of the event, namely when it is realized as in *John arrives*.

The relation between the two parts of the definition then has to do with the traditional grammarian's category of 'Mood'. The 'atemporal' character of a State can be considered a 'modal' property. Lyons (1977:677) has observed that the expression of futurity in language never involves an exclusively temporal concept, but necessarily includes an element of prediction or a modal notion. For mnemonic purposes, it is important to keep in mind that the subscript _n will consistently be used in the subevent structures proposed to indicate all types of [-realized] subevents. The importance of this definition for the control problem will become clearer later on. Before going back to the analysis of control proper, it is important to discuss the way in which thematic roles are represented and derived in Pustejovsky's (1988) framework.

An interesting property of Pustejovsky's compositional representation is that it integrates two types of semantic structures that are essential for the semantics of verbs: the 'theta- grid' (Stowell 1981) of the verb on the one hand, and the temporal-aspectual, internal development of the verbal event on the other. Both aspects of the lexical semantics of verbs will be shown to be essential for control. Moreover, the flexibility of the representation allows for a large number of combinations of the Event- types State, Process and Transition are possible. Notice that in this framework, thematic roles are embedded in a complex subeventual frame representing the temporal development of the verb. The subeventual representation of transfer verbs allows Pustejovsky (1988) to view thematic roles of the Source - Theme - Goal type as notions derived from a temporal structure, and not as basic elements of a theory of thematic roles. Presumably, the same analysis can be applied to the class of verbs expressing the same type of transfer as *give* such as *grant*, *lend*, *hand*, *donate*. The representation provides for more fine-grained distinctions among thematic roles than that of classical thematic roles, allowing for a representation of the distinction between *give* and *throw* (Pustejovsky 1988).

It is clear that representations similar to that of (8b) can be used to determine the semantic specificity of each class of control verbs expressing 'transfer': the verbs of the *propose*, *offer* type, the verbs of asking, and the verbs of the *promise* type. In this way, the different conceptual structures associated with each verb class can be mapped into different event structures. This representation will make it possible in section 6 to make the minimal semantic differences between these verb classes fully explicit, given some additional specifications of the thematic properties present in the event structure. As already observed, Pustejovsky's (1988) framework allows for the integration of causation properties in the aspectual event structure of verbs. In the analysis of control verbs presented here, these agentive thematic predicates will be described in terms of the (Proto-) Agent properties introduced by Dowty (1989, 1991). Attempting to explain subject selection principles by a reduction of thematic roles to the basic notions of (Proto-) Agent and (Proto-) Patient, Dowty (1991) uses the characteristics of agency put forth by Keenan (1976, 1984) to redefine Agent and Patienthood as clusters of properties. (Proto-) Agent is thus viewed as a cluster of properties such as VOLITION, SENTIENCE, CAUSATION and MOVEMENT. All of these properties do not have to be realized at the same time on an agentive argument. For instance, the subjects of control verbs with the minimal internal structure of States such as *want* or *love* may only be characterized by the properties of resp. Volition and Sentience. Interestingly, this 'cluster' view of Agent - Patient properties entails that all agentive properties do not

have to be realized on the external argument: internal arguments may also have agentive properties. The importance of this enrichment of Pustejovsky's representation of event structure will become clear in the semantic description of control verbs and the explanation of their control properties. At this point, it is important to observe that this framework enables us to express the semantics of verbs expressing 'transfer' (*propose/ promise/ give/ ask*) and verbs not expressing 'transfer' (*love, want*) with the same basic tools of semantic representation. I claim that the semantics of event structure is the semantic representation which allows for distinguishing each class of control verbs from the other (cf. section 6). This is the answer to question (6i).

However, the semantic representations of each class of control verbs do not explain anything about control by themselves. Question (6ii) still needs to be addressed: which properties in this semantic representation determine control? How can Pustejovsky's (1988) descriptive formalism offer us an insight into the way in which PRO obtains its reference? I would like to claim that control is determined by the temporal subevent structure of the matrix verb along the lines of the following descriptive principle:

- (10) *The aspectual restriction on controller assignment (ARCA)*
- A. Only arguments embedded in temporally unrealized subevents (States or Processes) as co-arguments of the infinitival argument are controllers of the unexpressed PRO subject of the infinitival argument.
 - B. If the set of possible controllers determined by A is greater than one, a thematic hierarchy determines that the (Proto-) Agent argument must be the controller of PRO.

ARCA. A is responsible for singling out the set of possible controllers among the arguments of the matrix verb. In section 6, this principle will be shown to predict that both the subject and the indirect object are possible controllers for the unexpressed subject of the infinitival argument of verbs such as *propose, promise* and *ask* (3--5), and that only the object is a possible controller for verbs of 'influence' such as *force* and verbs of 'judgment' such as *praise* (2). ARCA. B only applies if the event structure of a control verb with three argument slots contains two temporally 'unrealized' subevents, each embedding a different argument besides the infinitival argument. ARCA. B is instrumental for certain types of subject control verbs, variable control (4) and the control shifts displayed by verbs of promising (5ab) and asking (5cd). Notice that ARCA. B introduces an Agent -- Patient hierarchy into the determination of controllerhood, similar to the one first proposed by Foley & van Valin (1984:304--310). However, in our approach the application of this thematic hierarchy is limited to the set of possible controllers of a control verb: the thematic hierarchy is crucially dependent on ARCA. A, which will be reduced to a precise formulation of semantic selection under proper government.

Let us take a concrete example to see how this descriptive principle works. In French, a number of 'transfer' verbs of the *give* type can function as object control verbs in the same way as *force* (2). Although this sentence has a rather literary flavor, its control properties are

clear. The sentence (11a) can be represented in (11b) by changing the variables of the representation (8b):

- (11) a. Que les dieux lui donnent/ accordent de réussir sa traversée de l'Atlantique
 'May the Gods give/ grant him to succeed in his crossing of the Atlantic'
 b. [T e₁*_{act} (Gods) & move (Gods, succeed) e_{n+1} (succeed, him)]_T

Both subevents contain a referential argument and the infinitival Theme argument. The first subevent including the 'Source' argument is linked to a punctual moment indicated here by the numerical subscript. This subevent can be considered a 'realized' subevent, since it 'starts' the event: it is linked on the time axis to a specific point in time which coincides with the tense of the temporal morphemes in T°. Only the 'Goal' argument is embedded with the infinitival argument in a Stative subevent which refers to a temporally extended period after the punctual moment of giving. According to the definition (9), only this second subevent is a temporally 'unrealized' subevent, since it refers to the future with respect to the subevent e₁. The 'unrealized' property of the subevent is represented by the subscript _n in the subevent e_{n+1} of (11b). ARCA. A correctly predicts that only the argument embedded in the second Stative subevent, the 'Goal argument', can be a controller.

The question now arises as to why there would be a relation between [- realized] aspect (ARCA. A) and control. Why would a principle such as ARCA. A be relevant for control? Relating this question to our question (6iii), the problem can be reformulated as follows: how can ARCA. A be reduced to semantic selection under proper government? The next section will offer a solution to this problem, and further outline the syntactic underpinnings of an analysis relating aspect and control in our answer to question (6iv) in section 4.

4. TEMPORAL IDENTIFICATION OF THE INFINITIVAL C°

The constraint in ARCA restricting control to [- realized] subevents can be linked to the untensed character of the embedded infinitive. It is usually assumed that untensed verbs have an INFL node that does not realize an independent temporal reference. Infinitives are said to have a feature [- Tense]. In this respect, Bresnan (1972) notes that infinitival complements refer to 'something hypothetical or unrealized'. Guillaume (1929) already defined the infinitival tense as a tense 'in posse': it expresses 'potential' time, or eventuality, which is opposed to tense 'in esse', a 'real' or finite time reference linked to the time axis. Stowell (1982) makes a similar observation stating that the tense of infinitives must be semantically interpreted as unrealized or as a 'possible future'. Stowell (1981) challenges the idea that infinitives are [-tense] and suggests instead that they are [+ Tense], but lack a [± Past] feature. This translates the idea that infinitives are not linked to a specific moment on the time axis with respect to future or past, they express 'possible time'. Carlson (1984) appropriately proposes to view untensed verbs semantically as eventualities, an epistemic modal notion. Following these authors, we think that it is appropriate to semantically interpret the infinitival morphology as temporally 'unrealized': an infinitive is not linked to a specific point on the time axis: it is undetermined for a specific moment realizing the event.

The infinitival morphology denotes a temporally ‘unrealized’ tense that can be modally interpreted as an eventuality.

ARCA. A restricts controllerhood to those arguments that are part of a temporally ‘unrealized’ subevent. The relation between a temporally ‘unrealized’ subevent of the matrix control verb and an infinitival eventuality could then be viewed as formal identification between identical or mutually identifiable features. This identification could then ensure, in a way to be further specified, that only the argument linked to the temporally ‘unrealized’ subevent is available for Binding by the unexpressed anaphoric infinitival subject.

Is there any evidence independent of control that there actually is such a temporal identification of the infinitival morphology by the semantics of the matrix verb? It has long been noted that the temporal reference of infinitives is determined by the semantics of the matrix verb. Among other verb classes, Palmer (1974) distinguishes between verbs of ‘futurity’ and verbs of ‘effort and achievement’. Infinitives selected by verbs of ‘futurity’ (*wish, decide, persuade, expect, promise*) refer to the future, whereas infinitives selected by verbs of ‘effort and achievement’ (*manage, try, remember*) do not refer to the future (Palmer 1974:195--206). Lasnik & Fiengo (1975) observe that a control verb imposes selectional restrictions on its infinitival complement: a verb such as *force* does not normally select stative verbs such as *resemble*. Moreover, Rooryck (1987) has shown that there is a remarkable correspondence between temporal and aspectual restrictions on the infinitive on the one hand and control properties on the other: a semantically homogeneous verb class shares both homogeneous control properties and the same aspectual and modal restrictions setting it apart from any other control verb class. An adequate theory of control should explain this close correspondence between control on the one hand and the temporal -- aspectual restrictions of the infinitival argument on the other hand. Let us therefore briefly develop the idea of the temporal determination of the infinitive by the matrix verb.

Stowell (1982) has been the first to try to formalize the temporal determination of gerunds and infinitives by the matrix verb. Stowell (1982) argues that there is a difference between infinitives and gerunds in the way their temporal reference is determined. The tense of gerunds is determined externally by the semantics of the control verb. The tense of infinitives is not so determined according to Stowell (1982): infinitives have an independent tense in the same way as tensed clauses, their tense is internally determined as ‘unrealized’.

- (12) a. Jenny remembered to bring the wine
- b. Jenny remembered bringing the wine
- (13) a. Jenny tried to lock the car
- b. Jenny tried locking the car

Stowell (1982) observes that the tense of sentences such as (12a--13a) is specified as unrealized with respect to the tense of the matrix verb: Jenny has not yet brought the wine when she remembers to do so and she has not yet locked the car when she tries to do so. In (12b--13b), the gerund is interpreted with respect to the semantics of the matrix verb: since remembering is about the past, the gerund is interpreted with respect to the past, and in (13b) the gerund is ambiguous between an unrealized and a present interpretation. Stowell (1982)

suggests that there is a tense operator in COMP to link the ‘unrealized’ tense of infinitives to the tense of the matrix verb. Gerunds do not have such a tense operator: they depend for their temporal interpretation on the meaning of the governing verb (Stowell 1982).

However, there are a number of arguments against the idea that the tense of the infinitive is dependent on the matrix tense. A first problem for this approach is that it predicts that the tense of the infinitive should always be interpreted with respect to the future of the matrix verb. This prediction is not carried out: verbs such as *like* select an infinitive that is not necessarily interpreted with respect to the future of the tense of *like*:

- (14) Jenny likes to go to the movies

Sentence (14) means that at the time of the present tense, Jenny likes her experiences of going to movies, both past and present. Stowell’s (1982) analysis predicts that the only relevant interpretation is one where Jenny likes her future experience of going to the movies.

A second argument against Stowell’s (1982) analysis comes from French. In French, argument CPs with a [- realized] tense feature are always expressed by infinitives. As in English, the infinitive selected by *se souvenir* ‘remember’ is interpreted as future with respect to the moment of remembering.

- (15) Jenny s’est souvenu à temps de prendre le vin
‘Jenny remembered in time to take the wine’

This suggests that the French infinitive is temporally on a par with the English infinitive rather than with the gerund. Similarly, object control verbs of the *persuade, force* type impose an interpretation of the infinitive that is situated at an undetermined point in time after the moment of persuading or forcing. However, object control verbs of the ‘judgment’ type such as *punir* ‘punish’, *féliciter* ‘congratulate’ allow for an interpretation of the infinitive that is situated at an undetermined point which may be past or future with respect to the time of the judging or congratulation event.

- (16) a. Isidore m’a imposé de/ invité à/ permis de venir à la fête.
‘Isidore imposed coming to the party on me/ invited me/
allowed me to come to the party’
b. Basile a puni/ félicité/ plaint Mylène d’avoir écrit/ écrire cet article.
‘Basile punished/ congratulated/ pitied Mylène for having written/
writing that article’

The analysis of (15) shows that French infinitives pattern with English infinitives rather than with gerunds with respect to their temporal interpretation. The temporal interpretation of the infinitive in (16b) preferentially refers to an event that has occurred before the moment of congratulating or punishing. As a result, (16b) clearly shows that the temporal interpretation of embedded infinitives must be determined by the matrix verb rather than by the matrix tense. The temporal interpretation of the infinitive by the matrix verb can only

take place via proper government by the matrix verb of the embedded C° heading the CP complement. I would like to propose an analysis for the temporal interpretation of infinitives and gerunds in which only the matrix verb determines the tense of the infinitive or the gerund, rather than the matrix tense.

There is ample evidence in the literature for the temporal character of C° . It has often been noted that tensed and untensed C° always correlate with tensed and untensed T° : in English the infinitival T° contains the infinitival morpheme *to*, while tensed CPs have an optional *that* complementizer. In French, the tensed complementizer *que* and the untensed complementizers *de*, *à*, and \emptyset are in complementary distribution (Long 1974, Kayne 1981, Huot 1981). It can be assumed that T° and C° are non-distinct in features. Nondistinctness of features between C° and T° also allows C° to transmit features to T° by virtue of their being coindexed. I will assume that the [- realized] C° head of the embedded infinitive mediates the selectional restrictions exercised by the matrix verb on the embedded infinitive with respect to the temporal interpretation of this infinitive. The *-ing* morphology of the gerunds (in the embedded T° or V°) is also [- realized]. It may be identified by the matrix verb in a slightly different way, since it is not identical to the infinitival morphology.⁴ Both C° and the temporal morphology of the gerund receive the temporal interpretation for the embedded clause from the matrix V° .

But how should the selectional restrictions expressed in (14) and the interpretive constraints noted in (12--13) and (15) be conceived of? One could of course simply encode in the lexical entry of both verbs the fact that *try* selects a C° with a future interpretation, and that *remember* selects a C° that can refer both to a past and a future event. This information could be encoded as part of an unordered set of lexical features, following Chomsky (1965). However, it seems highly unlikely that the temporal restrictions on the infinitive selected by a verb would be independent of its temporal event structure. Consequently, it might be interesting to make these restrictions follow from the semantic structure of the selecting verb. This now allows a further clarification of the idea that the [- realized] morphology of the infinitive is identified with the [- realized] features of the event structure of the matrix verb. In order to do this, it simply has to be shown that the temporal restrictions on the [- realized] gerund or infinitive follow from the event structure of the matrix verb. In addition, the different temporal interpretations of English infinitives and gerunds have to be explained by showing that both are temporally identified by the matrix verb, but in different ways.

Let us take up again Stowell's examples *remember* and *try*, and try to derive both his observations about the temporal interpretation of the infinitive and the gerund, and our own remarks about infinitival selection. The verb *remember* can be represented as follows:

- (17) a. Jenny remembered the wine
 b. $[T \text{ } e_n \text{ sent (Jenny, wine) } e_1^* \text{ sent (Jenny, e) }]T$

⁴ Contrary to the infinitival morphology, the *-ing* morphology also has a [+ durative] feature, and, though it is 'unrealized', it does not have the interpretation of a 'possible future', an eventuality. The [- realized] feature only applies to the fact that the event is not linked to a specific moment on the time axis. The [+ durative] feature in addition specifies that this event is 'spread out' over different unspecified moments of the time axis.

The verb *remember* can be represented as a Transition verb: from the point of view of its internal temporal development, it intuitively represents a change between a State of knowledge or experience of something, represented here by the predicate *sentience* on the first subevent e_n , and the punctual moment of remembering that knowledge or experience which heads the event structure. Since *remember* does not involve any agentivity on behalf of the subject, we represent the predicate as a punctual *sentience* predicate that should be distinguished from the one on the first subevent. Recall these predicates express relatively abstract relations between the arguments. Notice that the nonpunctual State of knowledge or experience is temporally independent of the second punctual subevent on the time axis. This is because the State of knowledge or experience extends on the time axis both before and after the punctual moment of remembering: the experience or knowledge is not temporally limited by the punctual subevent of remembering it. Since the first Stative subevent in (17b) is not linked to the time axis with respect to the past or the future of the second subevent, it should be viewed as temporally ‘unrealized’ in the sense of (9a). Recall the subscript $_n$ is used in the subevent structures to indicate all types of [-realized] subevents.

When the argument realized by *the wine* in (17) is realized as an infinitive or a gerund as in (12), the [- realized] morphology of both the infinitive and the gerund is identified with the [- realized] subevent e_n . Since this subevent translating knowledge or experience is not temporally limited with respect to past or future, [- realized] morphemes that are identified with it can in principle refer to a time period before (past) or after (future) the second punctual subevent of remembering it. Besides their temporal [- realized] feature, infinitives as in (12a) have a modal ‘possible future’ or eventuality interpretation. This ‘eventuality’ feature of the C° head of the infinitival CP is identified in the time frame of the durative state of knowledge or experience with the ‘future’ period after the punctual moment of remembering which matches this ‘eventuality’ feature of the infinitive. For the past interpretation of gerunds (12b), I would like to propose a solution in the same spirit. The *-ing* morphology of the gerund, while lacking the temporal ‘eventuality’ property of infinitival C° s, has the feature [+ durative]. This feature also needs to be interpreted with respect to the subevent structure of *remember*. The feature [+ durative] presupposes that the event has already started its temporal progress. As a result, the [+ durative] feature has to be identified with respect to any part of the first stative subevent in the time frame of *remember* that occurs before the punctual subevent of remembering: anything taking place before the remembrance inherently implies duration, while anything taking place after the remembrance does not (yet) have duration. The temporal identification of the feature [+ durative] with the ‘past’ part of the stative subevent in (17) thus results in a past interpretation of the gerund⁵.

⁵ It seems that Stowell (1982) is not entirely correct in stating that the gerund in (12b) is interpreted with respect to the period before the punctual event because of the fact that one usually remembers things about the past. Contrary to the infinitive of *remember*, the infinitive selected by the verbs in (16b) refers preferentially to the past of the moment of punishing or congratulating. Like *remember*, the verb *punish* seems to have an event structure that is characterized by both a stative and a punctual subevent as in (27a). The stative subevent of *punish* can extend both before and after the punctual subevent of punishing. The punctual event of punishing does not say anything with respect to the temporal interpretation of the infinitive: one can very well be punished for something that extends before, during, and after the moment of punishing: in (16b) there is no reason to assume that the writing stops after the congratulation or the punishment. The only requirement is that the stative subevent is partly realized at the moment of punishing, as predicted by the analysis of the temporal

Both the past interpretation of the gerund and the future interpretation of infinitives then arise through the interaction between the stative subevent represented in the event structure of the matrix verb and the morphological features ('eventuality'/'durative') of the infinitives and gerunds themselves.

Most importantly, this analysis now also derives the control properties of *remember* according to ARCA. A.: both the infinitival argument and the controller are related to the argument variables in the temporally 'unrealized' first subevent of (17b). Consequently, the subject ends up as the controller of the infinitival subject PRO. Importantly, the control properties of the infinitive are derived from its temporal interpretation.

The selectional and interpretive temporal properties of *try* are much simpler to explain. This verb can be analysed with a simple Process event structure of the following type:

- (18) a. Jenny tried to lock the door
b. [P e₁ ... e_n]P act (Jenny, lock)

Since this event structure does not contain a subevent potentially referring to the past, gerunds cannot receive a past interpretation (13b). The possibility for the gerund to have either a present or an unrealized interpretation can be linked to the way in which the gerund is identified with the temporally 'unrealized' Process event, whose [-realized] property is indicated by the subscript _n.⁶ In a Process event, the present tense does not just coincide with the first subevent e₁ of the Process, but with the entire Process event. The durative [-realized] *-ing* morphology can either identify with the entire Process to coincide with it, yielding the present interpretation for the gerund, or it can identify with a stretch of moments after the moment e₁ which starts the event to yield the unrealized interpretation. Again, the control properties of *try* can be derived following ARCA. A, since both the untensed complement and the controller occur together in a temporally 'unrealized' (sub)event.

It is interesting to come back now to the temporal interpretation of the infinitival argument of the *give* type verbs in French in its relation to control. In (11a), the temporal interpretation of the infinitive with respect to the event of the matrix verb takes place in an undetermined future: when the Gods grant the traveller to arrive safely, he has not yet arrived safely. This future interpretation of the infinitive can be derived, since the [-realized] second subevent in (11b) must be identified by the infinitival [-realized] C°. It was already shown that following ARCA. A, only the 'Goal' argument occurring with the infinitival argument in this second subevent can end up as the controller. In section 6, it will be argued that the temporal interpretation of *force* type verbs and judgment verbs in (2) is linked to their event

interpretation of gerunds presented here. The fact that *remember* imposes a past interpretation only for the gerund can be attributed to the fact that one cannot remember something while at the same time experiencing it: there can be no overlap between the stative subevent and the punctual remembrance event.

⁶ A similar analysis is possible for *like* in (14). *Like* has a Stative event structure. An infinitive or a gerund can only be interpreted with respect to the entire State. As a result, the infinitive selected by *like* gets an interpretation in which the event expressed by the infinitive is in a sense 'coextensive' with the State. This temporally 'coextensive' relation between the matrix State and the infinitive or gerund is why *Jenny likes to go/going to the movies* refers to all of Jenny's moviegoing experiences, past and present.

structure in a similar way. For now, it seems that the analysis presented here can integrate most of Stowell's (1982) observations and circumvent its limitations. To conclude, I have shown that both control according to ARCA. A. and the temporal interpretation of [-realized] clauses can be derived from the event structure of the matrix verb, and that there is a strong link between these two phenomena.

5. LEXICAL COINDEXATION OF C° IN V° AND BINDING OF AGR_S°

The important question that comes to mind now is exactly how this identification of [-realized] features present in both the matrix event structure and the embedded infinitives or gerunds should be formally realized. The simplest way to formally express the idea that the [-realized] morphology of the infinitive or the gerund is selectionally identified by the event structure of the matrix verb would be to assume that selectional identification involves coindexation between aspectual [-realized] properties of the event structure of the matrix V° and the temporal [-realized] features of the embedded infinitives or gerunds under proper government. Obviously, this coindexation cannot simply involve referential coindexation of the infinitival C° and the V° . Coindexation of the infinitival C° with elements of the matrix event structure must be a partial coindexation of the [-realized] C° with a temporally 'unrealized' subevent in the event structure of the matrix V° . Identification of [-realized] features via coindexation then involves the following syntactic configuration:

- (19) $[V^\circ e_i (e_j)]V^\circ \dots C_i \dots AGR_i \dots T_i \dots V_{inf_i} \dots$
 where the index i refers to temporally [-realized]

This means that a temporally [-realized] C° is coindexed with a temporally 'unrealized' subevent of the verb in the matrix clause, rather than with the whole V° - T° - AGR_S° complex of the matrix verb. How should the notion of partial coindexation of C° in V° be conceived of in the grammar?

I would like to suggest that identification of temporally [-realized] features via partial coindexation is an instance of semantic selection by a V° head on the X° head of its XP complement. Since Chomsky (1965), selectional restrictions have mainly been thought of as applying to NP complements: a verb such as *eat* only selects NPs with semantic features that are specified in the lexical entry of the verb:

- (20) Louise eats raspberry pies/ *? sincerity.

This type of selection can be conceived of as a type of identification: the semantic properties of the selected N° must match those of the lexical specification. Now the head C° is also selected by the governing V° head: interrogative verbs select interrogative C° s (Bresnan 1972). Alternatively, one might say interrogative C° s match the lexical specification of the governing verb. The idea of selection of C° by identification can now be extended to the temporal feature [-realized] of the infinitive: a [-realized] C° is identified by V° in exactly the same way as a [-abstract] N° is identified by the V° governing it. To make the notion of

coindexing more precise, the following principle can be proposed as a general condition on selectional coindexation:

- (21) *Principle of maximal identification of features:*
 Coindexation under government involves the maximal identification of features between the coindexed elements.

With respect to the requirement of maximal identification of features, the temporally [-realized] eventuality feature of C° will be identified and coindexed with a feature of the matrix V° which governs it, if nothing prevents V° from governing C° . There is a further restriction on this identification which is present in the formulation of ARCA. A, and which can be derived from more general principles. ARCA. A states that the infinitival argument, or rather the argument variable representing the infinitive, must be a co-argument of the controller in the temporally ‘unrealized’ subevent. In terms of coindexation of C° , this means that the infinitival CP must itself be lexically represented in the ‘unrealized’ subevent in order for identification and coindexation of C° to come about. This restriction in itself is intuitively reasonable: the infinitival [-realized] C° cannot ‘recognize’ temporally ‘unrealized’ subevents with which its CP has no semantic relation. Nevertheless, the restriction stipulating that the infinitival CP should be lexically represented in the subevent with which C° is coindexed should follow from general principles.

This restriction can be derived if we take into account Stowell’s (1981) discussion about proper government. Stowell (1981:376) wonders why proper government by a lexical head is equivalent to coindexing with an antecedent. He suggests that if these two types of government form a natural class, there should be an underlying property unifying them. This underlying property lies in the way thematic roles are assigned, according to Stowell (1981:381--384). Stowell (1981) views the ‘matching’ between projected A-positions and the \square ‘slots’ in the lexical representation of the verb as the assignment of the referential index of the subcategorized object to the slot in the thematic grid. \square role assignment is the identification of the arguments of the verb by relating their indices to the ‘slots’ in the thematic grid (Stowell (1981:382). The arguments of the verb are then coindexed with subparts of the verbal structure.

In the event structure analysis advocated here, thematic roles are represented as ordered variables (with subcategorization specifications) embedded in the temporal event structure of the verb. In the analysis presented here, Stowell’s (1981) idea can be easily integrated: we will assume that the CP argument identifies its variable in the \square grid or event structure by assigning its index to it, and thus enables the [-realized] head C° to identify the temporally [-realized] properties of the subevent. The first identification is thematic, and the second has to do with selectional restrictions. In the same way, the NP *a raspberry pie* is identified with the internal \square role of *eat* in (20), and the N° head *pie* identifies its features with the selectional features ([-abstract,...]) linked to the internal \square role. The head of a subcategorized complement can only identify its features with those of the matrix V° if this subcategorized complement has identified and coindexed its \square role in the event structure of the matrix verb. This hierarchy of identification is in line with Jackendoff’s (1987) assumption that selectional restrictions are part of a subvocabulary of conceptual argument structure or \square theory, that is

nevertheless distinct from \square theory. The lexical coindexation of the temporally [- realized] C° can only take place if the CP is first identified and coindexed in the event structure. In this context, the only subevent the C° head can coindex with is the subevent in which the CP is lexically represented by an argument variable to which it assigns its index. As a result, the restriction limiting coindexation of C° to those subevents in which CP is embedded as an argument can be derived from general assumptions about the relation between thematic roles and selectional restrictions.

In (6iii), part of the control problem was formulated as the question of how the semantic representation of control verbs can determine control respecting standard assumptions about selection by a verbal head. The answer proposed here is that the embedded C° is coindexed with the temporally [- realized] subevent in the event structure of the matrix verb. In this way, the descriptive aspectual restriction of ARCA. A can be reduced to the temporal coindexation of temporally [- realized] C° and the temporally [- realized] subevent in V° . This identification in terms of coindexation is necessary for reasons independent of control: the temporal interpretation and selectional restrictions on the infinitive, which also depend on the event structure of the matrix verb, are equally determined by this coindexation. Observe that the part of ARCA. A which links [- realized] subevents to control still needs to be derived. Hitherto, ARCA. A still is a merely descriptive statement about controllerhood. Reformulating question (6iv), the question arises as to how the coindexation of C° in the event structure of V° further restricts binding of PRO by an element in the matrix clause, so that ARCA. A may be completely reduced to independent principles of the grammar.

The control relation can be viewed as a consequence of the interaction of this highly structured temporal - aspectual coindexation mechanism with the Binding properties of the unexpressed infinitival subject. First of all, Borer's (1989) idea will be adopted that the embedded AGR_S° is the element that is instrumental in establishing the referential link of PRO with the controller in the matrix clause. Borer (1989) analyzes AGR_S° as an anaphor which moves to C° . In this way, the Binding domain of this AGR_S° is extended to the matrix clause, eliminating the need for the notion of Domain- governing category proposed by Manzini (1984).⁷ In addition, Borer (1989) proposes that AGR_S° is the element subject to

⁷ See also Koster (1984), Lebeaux (1984), Vanden Wyngaerd (1994) for alternative proposals to extend the governing category of PRO to the matrix clause.

In addition to the syntactic arguments for the anaphoric nature of PRO/ infinitival AGR_S° , there are classical semantic arguments to the same effect. Castañeda (1966), Fodor (1975), Helke (1979), and Higginbotham (1989) have argued that infinitival subjects receive an interpretation corresponding to 'self' or 'he himself'. Fodor (1975:133--134) uses the scope properties of *only* to claim that (i) is equivalent to (ii), but not to (iii-iv). Fodor (1975) convincingly argues that to remember giving the speech entails what he terms an 'epistemic privacy': only the person giving the speech can remember doing so, whereas remember his/ Churchill's giving the speech can be done by anyone who heard the speech.

- i. Only Churchill remembers giving the speech about blood, sweat, toil and tears (= Fodor 1975:133(9))
- ii. Only Churchill remembers himself giving the speech ... (= Fodor 1975:133(10))
- iii. Only Churchill remembers his giving the speech ... (= Fodor 1975:133(11))

Binding rather than PRO.⁸ In addition, I would like to adopt Kayne's (1990) idea, who takes advantage of the revision of Binding theory proposed in Chomsky (1986:170ff.) to suggest that the governing category of an anaphor in subject position cannot be the X^{\max} of that anaphor, but rather the next category up, since the subject position of that X^{\max} is not a potential binder for the anaphor. The anaphor cannot be bound in its own X^{\max} because there is no position that might contain a potential binder (Kayne 1990). Kayne intended these remarks for PRO as an anaphor, but it is clear that they carry over to AGR_S° as an anaphor in Borer's (1989) sense. In this way, no special devices are necessary to extend the governing category of AGR_S° to the matrix clause. PRO gets its reference via Spec - head agreement with the anaphor AGR_S° . The fact that AGR_S° is an anaphor entails that in principle it can get the reference of any argument in the matrix clause.

Our proposal is now that this essentially free Binding of AGR_S° in the matrix clause is constrained by the index which the infinitival C° (and hence T°) receive under government from the matrix V° . The AGR_S° node of the embedded infinitive is governed by and coindexed with the infinitival C° and T° nodes which have the index of the temporally [-realized] subevent. The AGR_S° node of course does not inherit the [-realized] reference of C° : AGR_S° has only nominal features [\square person, \square number, \square gender] and cannot receive a [-realized] reference, since this is a temporal feature. Only the embedded T° fully shares the [-realized] feature of the infinitive. Nevertheless, coindexing of the infinitival T° and AGR_S° , and perhaps C° , is obligatory by their functional status with respect to V° : the temporal and nominal reference of the subject which is expressed on the verb must coincide. Let us represent this by provisionally assuming that the 'outer shell' of the AGR_S° node (but not its features) takes on the index of C° and T° . In the preceding paragraphs, it was argued that the head C° of CP is identified by the temporally 'unrealized' subevent in the matrix V° by identification under proper government. This indexation of the infinitival functional nodes can be represented in the following scheme with the index **n**, which is used throughout to refer to both [-realized] subevents and tenses. The structure (22) is a more detailed version of (19):

iv. Only Churchill remembers Churchill(s) giving the speech ...
(= Fodor 1975:133(12))

⁸ I will take no position as to whether the Binding domain for AGR_S° is extended by moving AGR_S° to C° .

$$(22) \quad \mathbf{X} [\mathbf{V}^\circ (\mathbf{x}, \mathbf{CP}) \mathbf{e}_\mathbf{n} (\mathbf{y}, \mathbf{CP}) \mathbf{e}_\mathbf{m}] \mathbf{V}^\circ \mathbf{Y} [\mathbf{CP} \mathbf{C}^\circ_\mathbf{n} \dots \mathbf{AGRS}^\circ (\mathbf{n} (\mathbf{x}/\mathbf{y})) \dots \mathbf{T}^\circ_\mathbf{n} \dots \mathbf{V}^\circ \mathbf{inf}_\mathbf{n} \dots]$$

- where (i) \mathbf{X} , \mathbf{Y} and \mathbf{CP} are the projected arguments of the verb
(ii) \mathbf{x} , \mathbf{y} and \mathbf{CP} represent the argument variables in the event structure of the matrix verb coindexed with their projected arguments.⁹
(iii) The index \mathbf{n} represents a (sub)eventual ($\mathbf{e}_\mathbf{n}$) or morphological ($\mathbf{C}^\circ_\mathbf{n}$) temporally [- realized] feature, and the index \mathbf{m} a ‘realized’ subeventual feature.

What does it mean now for \mathbf{AGRS}° to receive the ‘same’ index as \mathbf{C}° and \mathbf{T}° ? Of course there cannot be an indexation of \mathbf{AGRS}° as indicated in (22) with nominal indexes contained in the temporal index imposed by \mathbf{C}° and \mathbf{T}° . It is more likely that the nominal index of \mathbf{AGRS}° , which is obtained by Binding with an argument in the matrix clause, simply must be *referentially compatible* with the index \mathbf{n} of \mathbf{C}° and \mathbf{T}° . To be referentially compatible with the index \mathbf{n} of \mathbf{C}° and \mathbf{T}° , the nominal index of \mathbf{AGRS}° simply must be contained in the lexical reference of \mathbf{n} . The lexical reference of \mathbf{n} is the temporally [- realized] subevent which contains both the \mathbf{CP} and another argument. Consequently, this referential compatibility between the lexically determined reference of \mathbf{C}° - \mathbf{T}° and the Binding of \mathbf{AGRS}° can only be achieved if \mathbf{AGRS}° is bound by the projected argument which is also lexically represented in the subevent with which \mathbf{C}° is coindexed. Only the noninfinitival argument in the subevent with which \mathbf{C}° is coindexed can be the antecedent of the anaphor \mathbf{AGRS}° . The nominal indexing on \mathbf{AGRS}° in (22) then represents the only licit configuration for control. It is the lexically determined index of \mathbf{C}° and \mathbf{T}° which narrows down the choice of the anaphor \mathbf{AGRS}° in the matrix clause. If \mathbf{AGRS}° took the index of an argument embedded in a subevent that is not coindexed by \mathbf{C}° and \mathbf{T}° , there would be a referential conflict in the functional categories of the infinitival clause. In this event, the index of \mathbf{AGRS}° obtained by Binding would be completely incompatible with the temporal reference identified by \mathbf{C}° in the matrix \mathbf{V}° , since on the level of the event structure the antecedent of \mathbf{AGRS}° would not be contained in the subevent identified by \mathbf{C}° . Binding of \mathbf{AGRS}° in the matrix clause is heavily restricted, since it must take an antecedent which is lexically identified in the subevent $\mathbf{e}_\mathbf{n}$. Only this coindexation of \mathbf{AGRS}° will ensure a coherent indexation of the $(\mathbf{C}^\circ) - \mathbf{AGRS}^\circ - \mathbf{T}^\circ$ string in the infinitival argument. The requirement on strict coindexing on the infinitival \mathbf{C}° - \mathbf{AGRS}° - \mathbf{T}° complex is satisfied by the compatibility of the lexical indexes of \mathbf{C}° - \mathbf{T}° with the Binding index of \mathbf{AGRS}° . Notice that this analysis completely derive the effects of ARCA. A, which will henceforth simply be referred to as a descriptive device for expository purposes. So-called control theory reduces to an explicit theory of semantic selection under proper government which interacts in a modular fashion with Binding theory. In fact, the identification and coindexation of \mathbf{C}° with (sub)events of the matrix verb functions as a semantic filter for Binding of the anaphor \mathbf{AGRS}° . If this line of reasoning is correct, the

⁹ From the representation in (27) which is close to that of ‘transfer’ verbs, the argument \mathbf{CP} seems to be identified in both subevents: this is only a consequence of the representation, and it is not a real problem for the analysis.

temporal identification of the infinitive with the matrix verb is ultimately responsible for the control relation as well. This determination of control by aspectual factors then explains Rooryck's (1987) observation on the correspondence between control properties and aspectual selectional restrictions displayed by control verbs.

6. EVENT STRUCTURE, BINDING, AND CONTROL: SOME EXAMPLES

6.1. *Object control*

An adequate analysis of object control has to explain why the object is the only argument that can function as a controller. Stated differently, an analysis of object control should motivate why the subject of object control verbs can never be the controller of the infinitival subject PRO. Previous syntactic and semantic approaches do not adequately explain the remarkable semantic cohesion of object control verbs that has been noticed by several authors establishing exhaustive lists of these verbs for French (Gross 1975) and English (Visser 1972, 1973, 1978, Wierzbicka 1987, Rudanko 1985, 1989). Object control verbs can be divided into two major semantic categories: the first category includes Transition verbs which could be termed verbs of 'influence': *force, impose, invite, order, allow, prevent*. A second important semantic class of object control verbs involves Transition verbs of 'evaluation' such as *praise, punish, accuse*.¹⁰

(23) Kim_i forced Sandy_j PRO*_{i/j/*arb} to do the dishes

(24) Kim_i praised/ punished Sandy_j PRO*_{i/j/*arb} for doing the dishes

Let us now analyze the event structures of these verbs and relate these to their control properties. The basic event structure of 'influence' verbs such as *force* can be represented as follows:

(25) [T e₁* act (Kim, (Sandy, do dishes)) e_{n+1} do dishes (Sandy)]T

The first punctual subevent represents the fact that the agentive subject *Kim* is involved in establishing a relation between the Patient *Sandy* and the argument *do the dishes*.¹¹ This is

¹⁰ The PP complement of *praise* and *punish* is clearly an argument theta- governed by the verb, as attested by the fact that it can be extracted out of a *Wh*- island:

i. This is a crime for which I wonder how hard the policemen will be punished

¹¹ It is important to view the CP *do the dishes* as a single argument, the action of which should not be confused with the event of the matrix verb. This point can be more clearly made with a verb such as *impose* which allows for both NPs and gerunds:

i. Géraldine imposed that party/ going to that party on François

The subevent structure of a verb such as *impose* is identical to that of *force*. The construction with a nominal argument in (i) makes clear that the event structure should simply specify a 'future' relation between the Patient

why the three arguments are embedded under the same causation predicate. The second subevent translates the fact that the relation between the Patient ‘influencee’ and the argument *do the dishes* can come about at any given moment after e_1 . In other words, the relation between the ‘influencee’ and that which is imposed on the ‘influencee’ can come about at any future moment after the punctual moment of ‘influence’: the event of doing the dishes can take place at any given moment in the future of the forcing subevent. The temporal interpretation of this infinitive can only refer to the future of the ‘influencing’ subevent as in (26). Verbs of ‘influence’ do not select infinitives referring to a moment before the punctual ‘influencing’ event:

- (26) * Kim_i forced Sandy_j to have done the dishes yesterday

The second subevent with its undetermined future temporal reference can be considered a temporally [- realized] subevent in the sense of (9b), since it clearly refers to a ‘possible future’. The temporal interpretation and the selectional properties of ‘influence’ verbs show that the infinitival C° is coindexed with this [- realized] subevent.

Object control can be derived from the event structure. The infinitival AGR_S° can only be bound by the object argument which is represented in the [- realized] subevent. Only this Binding of AGR_S° can ensure coherent coindexing of the infinitival C° - AGR_S° - T° complex. The agentive subject is embedded in a punctual ‘realized’ subevent and cannot be a controller, since the infinitival temporally ‘unrealized’ C° cannot be identified by and lexically coindexed with this subevent by the Principle of Maximal Identification of features. If AGR_S° were bound by the matrix subject, AGR_S° would end up with an index which is incompatible with the lexically determined temporal index of C° and T° . The lexical index of C° and T° and the index obtained by Binding of AGR_S° in the matrix clause have to be referentially compatible, and this can only be achieved if AGR_S° is bound by a matrix argument which is lexically represented in the subevent C° and T° are coindexed with.

The event structure of the ‘evaluation’ verbs is related to object control properties in a similar manner. Transition (‘achievement’) verbs such as *punish* can be represented with a punctual subevent heading the Transition event structure as in (27a). Transition verbs such as *praise* should be represented as in (27b) with an event structure headed by a Process subevent, since they can extend over time. In both cases, the subevent heading the event structure establishes a relation between the agentive subject and the subevent which is evaluated. The reason for this is that it is not so much *Sandy* which is being evaluated, but the relation of *Sandy* to his doing the dishes.

- (27) a. punish [T e_n do dishes (Sandy) e_1^* act (Kim, e)]_T
 b. praise [T e_n do dishes (Sandy) [P $e_1 \dots e_x$]P^{*} act (Kim, e)]_T

argument and *party*, without specifying that there is an ‘action’ to be carried out by the Patient: this would be to confuse the events of the matrix and the embedded verbs.

The first, Stative, subevent translates the fact that this subevent may be true of Sandy at any given time with respect to the past or future of e_1 . The evaluation takes place at a point in time which is independent of that nonpunctual Stative subevent: one can be praised or punished for a past or a future property or event. This subevent then can be characterized as [- realized] according to (9a). This temporally ‘free’ character of the subevent can be checked by the past (28a) and future (28b) interpretation of the infinitives:

- (28) a. Kim punished/ praised Sandy for having written/ writing
that article yesterday
b. Kim punished/ praised Sandy for leaving so soon tomorrow

This temporal interpretation of the infinitive is due to the fact that the infinitival C° is coindexed with the Stative [- realized] subevent. With respect to control, the coherent coindexation of the infinitival C° - AGR_S° - T° complex requires that the infinitival AGR_S° have a Binding index which is compatible with the index of C° . Only arguments that are lexically represented in the [- realized] subevent can comply with this requirement. Consequently, only the object argument *Sandy* in (28), which is embedded in the [- realized] subevent in the representations (27) together with the argument variable representing the infinitive, can be coindexed with the infinitival AGR_S° , and end up as the controller of the unexpressed infinitival subject. As a result, ‘evaluation’ verbs can only be object control verbs.

6.2. Variable and preferential control

We have already observed that verbs of the *propose, offer, suggest* class allow for free control (29), verbs such as *promise* and *guarantee* involve preferential subject control (30), and verbs of asking involve preferential object control (31):

- (29) Kim_i offered Sandy_j PRO_{i/ j/ i+j/ *arb} to do the dishes
(30) a. Kim_i promised Sandy_j PRO_{i/ *j/ *arb} to do the dishes
b. Kim_i promised Sandy_j PRO_{*i/ j/ *arb} to be allowed to do the dishes
(31) a. Sandy_i asked Kim_j PRO_{*i/ j/ *arb} to do the dishes
b. Sandy_i asked Kim_j PRO_{i/ *j/ *arb} to be allowed to do the dishes

These sets of verbs show a remarkably fine-grained semantic cohesion. The specific control properties of these verbs and their semantic coherence have been repeatedly noted for German *anbieten* ‘offer’ and *vorschlagen* ‘propose’ (Abraham 1982, 1983, Ruzicka 1983, Siebert-Ott 1983, 1985, Wegener 1989), but they have never been adequately explained in relation to other semantically coherent sets of control verbs implying ‘transfer’.

We think that a proper analysis of the event structure of these verbs can achieve a coherent explanation of both their semantic cohesion and their ‘variable’ control properties. In terms of ‘Source - Recipient’ relations, these verbs are identical to the object control ‘transfer’ verbs. If the semantic unity of these variable control verbs is to be analyzed in

intuitive terms with respect to the *give* type (11) verbs, we might say that the *propose*, *offer*, *suggest* class represents a type of ‘transfer’ that does not necessarily come about, and that may be ‘resisted’ by the ‘Recipient’. Let us replace the infinitive in (29) by a nominal argument to make the thematic structure of ‘transfer’ clearer:

(32) Kim offered Sandy an apple

In the subevent structure of this verb class, the transfer involved in *propose*, *offer*, *suggest* type verbs takes place at an undetermined moment in time after the time of the proposal. In terms of the entailments of the event of proposing/ offering something, the event structure of these verbs should at least incorporate the following structure:

(33) [T e_1^* vol (Kim, T) [T e_{n+1} act (Kim) & move (Kim, apple)
 e_{n+2} act (Sandy, e_{n+1}) & at (Sandy, apple)]T]T

The first subevent represents the punctual time of the proposal which is expressed as a volitional act of the subject to undertake a transition. This expresses the idea that *propose* involves the intention of a future giving event. The event time e_n of the embedded Transition is of course ‘unrealized’, since it is restricted to the ‘future’ time period after the time e_1 of the proposal. The index $n+1$ refers to a [- realized] ‘giving’ subevent that follows the punctual subevent e_1 , and the ‘receiving’ subevent takes place at an undetermined moment e_{n+2} after the subevent e_{n+1} . In plain English, (33) says that Kim has the intention of transferring something, that this transfer is to be executed by Kim at an undetermined moment in the future, that Sandy decides on whether Kim’s transfer comes about, and thus can come into possession of the transferred ‘Theme’ at the final moment in the development of the event. Notice that both the ‘Source’ and the ‘Recipient’ argument are described with agentive properties: this reflects the fact that the ‘transfer’ is in some sense subject to an active intervention of the ‘Recipient’ who can resist or accept the ‘transfer’ expressed in the first subevent of the embedded Transition.¹² This notion of ‘resistance/ acceptance’ is crucial in the semantic description of *propose* type verbs, since it allows to distinguish them from verbs such as *promise*. In the next paragraph, we will show that the event structure of *promise* also involves a ‘future transfer’, but it is intuitively clear that no notion of ‘resistance/ acceptance of transfer’ is involved in the semantic description of the Recipient in the event of promising. This intuitive notion of ‘possible resistance’ can be represented in the event structure if it is accepted that both arguments have agentive properties. The idea that different arguments of the same verb can share (Proto) Agent properties is due to Dowty

¹² One might ask at this point whether expressing two *act* predicates on two different arguments would not involve a violation of the $\bar{\square}$ -criterion. In a framework with clusters of Proto- Agent properties (*sentience*, *volition*, *movement*, *causation*, Dowty 1991), it could be argued that two arguments belonging to the same event structure cannot be characterized by exactly the same Proto- agent properties. The $\bar{\square}$ -criterion is preserved since every argument is uniquely determined by (Proto-) Agent/ Patient properties. This interpretation of the $\bar{\square}$ -criterion allows for two arguments with *causation* properties as in the case of *propose* type verbs, if at least one of the arguments also bears another Proto- Agent/ Patient property.

(1991). For *offer/propose* type verbs, we would simply like to say that the ‘Recipient’ argument is characterized by an agentive property, thus translating the intuitive notion of ‘resistance/ acceptance of transfer’ in agentive terms. This does not mean that both agentive arguments have the same thematic properties: unlike the ‘Recipient’ argument, the ‘Source’ argument also has the (Proto-) Agent property of volition.

The event structure of *propose/offer* type verbs in (33) can now be related to their variable control properties when the direct object of these verbs is realized as an infinitive. The temporal interpretation of the embedded infinitive shows that the coindexation of [-realized] C° must be with a subevent referring to a ‘possible future’, since infinitives referring to a moment before the punctual subevent ‘starting’ the offer are ruled out:

(34) * Kim offered Sandy to have done the dishes yesterday

In terms of the event structure in (33), the coindexation of [-realized] C° is possible with either subevent of the embedded Transition. Both the ‘Source’ and the ‘Recipient’ arguments of *propose/offer* type verbs are embedded with the infinitival Theme argument in the temporally undetermined [-realized] subevents of the embedded Transition in (33). Embedding in such a ‘nonrealized’ subevent is the most important condition for achieving the status of possible controller: as noted before, the Agentive external argument of *force* type verbs is only embedded in a punctual subevent and therefore does not meet the principal condition for possible controllerhood. The [-realized] C° head of the CP selected by *propose* and *offer* type verbs can now be coindexed either with the first or with the second subevent of the embedded Transition, triggering Binding of the infinitival AGR_S° by either the ‘Source’ or by the ‘Goal’ argument. Either Binding of AGR_S° can achieve coherent coindexing of the infinitival C°-AGR_S°-T° complex. In ARCA. B (10), we stated that a thematic hierarchy should designate the agentive argument as a controller in case there is more than one possible controller. However, since both arguments are agentive in the case of *offer/propose* type verbs, no particular controller will be chosen. Since the thematic hierarchy cannot apply, the ‘Source’, the ‘Recipient’, or both arguments can freely function as controllers.¹³ In this case, there are no lexical restrictions on Binding of the infinitival AGR_S° in the matrix clause, and the thematic hierarchy ARCA. B cannot apply since both arguments have agentive properties.

Given the event structure proposed for variable control verbs of the *propose/offer* type, we would like to analyze preferential subject (*promise*) or object (*ask*) control verbs in a similar way. As we already suggested, *promise* minimally differs from the *propose/offer* type

¹³ It might be objected that the possibility of split antecedents for the infinitival anaphoric AGR_S° suggest that control is not a true form of anaphoric binding. This is only true if AGR_S° is identified with anaphors of the type *himself*. Anaphors such as *each other* do allow for split antecedents. The claim implicit in this article then is that the infinitival anaphoric AGR_S° has properties of both *himself* and *each other*: it is nonreciprocal like *himself*, but at the same time allows for split antecedents like *each other*. The objection that this would not be a ‘true’ form of anaphoric binding presupposes that the range of coreferential relations relevant to Binding is restricted to anaphors such as *himself*. There is nothing inherent in Binding theory that would validate this restriction.

verbs in the agentive properties of the argument associated with the nonpreferential controller. Contrary to the ‘Recipient’ argument of the *propose/ offer* verbs, this argument should be viewed as nonagentive. Hence, the event structure of *promise, guarantee* in (35) involves the subevents expressed in (36):

- (35) Kim promised Sandy an apple
 (36) [T e_1^* vol (Kim, T) [T e_{n+1} act (Kim) & move (Kim, apple)
 & at (Sandy, apple)]T]T

As can be seen from the event structure of *propose/ offer* type verbs, the only difference between the event structure of *propose/ offer* and *promise/ guarantee* lies in the absence of agentive ‘resistance’ to the ‘transfer’ for *promise/ guarantee*. An event of promising involves a punctual subevent e_1 translating the volition of the subject to undertake a future ‘transfer’.

Verbs of asking can be given an event structure that is the thematic converse of verbs of the *promise* class. The ‘Source - Goal’ relations of these verbs are linked to exactly the opposite arguments. The subject ‘Source’ of *promise* type verbs, resembles the object ‘Source’ of *ask* type verbs in that both arguments must be represented in the event structure as initiating the possible ‘transfer’ of the ‘Theme’ argument.

- (37) Kim asked Sandy for an apple
 (38) [T e_1^* vol (Kim, T) [T e_{n+1} act (Sandy) & move (Sandy, apple)
 & at (Kim, apple)]T]T

The event structure of verbs of asking may be paraphrased as follows: at a punctual moment e_1 , the subject *Kim* expresses volition with respect to a future ‘transfer’. The ‘Source’ *Sandy* may initiate the ‘transfer’ of the ‘Theme’ *apple* at an undetermined time e_{n+1} after the time e_1 of asking, and the subject *Kim* may come into possession of the *apple* at an undetermined moment e_{n+2} ($=e_{at}$) after the initiation of the transfer. This event structure is almost identical to that of *promise/ guarantee* in (36), with the exception that the order of subject and indirect object in the second subevent are reversed.

In the same way as for the *offer/ propose* type verbs, the ‘transfer’ associated with *promise* and *ask* can¹⁴ be carried out at an undetermined time e_{n+1} after the time of promising or asking, and the ‘State of possession’ of the ‘Recipient’ is established at a time e_{n+2} ($=e_{at}$) after the initiation of the ‘transfer’. Again, there are two [-realized] subevents in this event structure. When the ‘Theme’ is realized as an infinitive, the infinitival [- realized] C° must be coindexed with one of these ‘possible future’ [- realized] subevents. This can be checked by

¹⁴ The necessary character of the notion of ‘obligation’ in the definition of *promise* has been discussed by Searle (1969), Boguslawski (1983) and Wierzbicka (1987). Note that the notion of ‘obligation to give in the future’ (*promise*) are semantico-pragmatic rather than thematic in nature: the notion of obligation may disappear in unsincere promises. Our discussion of control does not make reference to this ‘cancellable’ notion of ‘obligation’.

the fact that *promise/ guarantee* and verbs of asking cannot select an infinitive referring to the past:

- (39) * Thérèse promised/ guaranteed/ asked her friends to have left yesterday

How can the event structures (36) and (38) be linked to ‘preferential’ control properties? Recall that the coherent indexing of the infinitival C° - AGR_S° - T° complex requires AGR_S° to have an index compatible with that of C° : this requires the argument binding AGR_S° to be lexically represented in the subevent C° is coindexed with. As for *propose/ offer* type verbs, both the subject and object arguments of *promise* and *ask* are embedded in temporally undetermined and hence [- realized] subevents with the ‘Theme’ infinitival argument. Since coindexation of C° can be either with the subevent embedding the ‘Source’ or with the ‘Recipient’ argument, AGR_S° can be coindexed with either argument. Binding of the infinitival AGR_S° in the matrix clause is not restricted to any particular argument, both subject and object belong to the set of possible controllers. In the case of *offer/ propose* type verbs, the thematic hierarchy ARCA. B did not apply because of the fact that both the ‘Source’ and the ‘Recipient’ arguments bear agentive properties. This is not the case for *promise/ guarantee* type verbs: the ‘Recipient’ is not characterized by agentive properties. The thematic hierarchy in ARCA. B thus ensures that the agentive subject of *promise/ guarantee* ends up as the preferential controller as in (30a).

Sentence (31a) clearly shows that the ‘Source’ argument of verbs of asking is the preferential controller. How can this argument be characterized as the agentive argument? In the event structure (38) of verbs of asking, the subject bears the (Proto-) Agent property *volition* with respect to the Transition expressed in the second subevent. However, the ‘Source’ argument is characterized by more (Proto-) Agent properties: the properties of *causation* and *movement* translate the initiation of the ‘possible future transfer’. Following Dowty (1991), this ‘Source’ argument then is the most agentive argument in the event. Consequently, the thematic hierarchy ARCA. B will designate it as the preferential controller. The event structure of verbs of ‘asking’ then not only is the converse of the event structure of *promise* type verbs in terms of ‘Source - Recipient’ relations, but also with respect to control properties.

Control shifts occur in modal and passive contexts through a thematic mechanism interacting with Binding and ARCA.B. Whenever the preferential controller of *promise* and *ask* coincides with the implicit agent of the embedded passive (*to be allowed (by X)*), the controller is interpreted as both subject and implicit agent of the infinitive. Such structures are ruled out independently (**Jane_i is allowed to leave (by X_i)*). Consequently, the preferential controller becomes unavailable for control. According to ARCA.A, both the Source and the Goal arguments of *promise* and *ask* are possible controllers, with the Source argument the preferential controller following ARCA.B. When the preferential controller is unavailable for control, the controller with less agentive properties (Goal) will be selected as the controller of the infinitive by the interaction of Binding and ARCA. The same explanation applies to those contexts in which modals trigger control shifts in French, and interrogative infinitives which trigger control shifts when selected by verbs such as *ask*:

- (40) a. Théophile_i a promis à Théodore_j de PRO_{i/*j} lire/ PRO_{*i/j} pouvoir lire le journal
 ‘Théophile promised Théodore to read/ to be allowed to read the paper’
 b. Eulalie_i a demandé à Euphrasie_j de PRO_{*i/j} lire/ PRO_{i/*j} pouvoir lire le journal
 ‘Eulalie asked Euphrasie to read/ to be allowed to read the paper’
 (41) Bill_i asked Bob_j how PRO_{i/*j} to shave himself

Interrogative infinitives trigger a deontic interpretation for the infinitive: *how to shave himself* here means *how he should/ could shave himself*, not *how he is/ will be shaving himself*. This deontic interpretation, which seems to be linked to the interaction of *Wh-* movement and [- realized] tense, has the same effect as overt modals such as *pouvoir* ‘can’: if the preferential controller (Source) is interpreted as the instance behind the permission/ obligation expressed in the embedded infinitive, this preferential controller becomes unavailable for control, and controllerhood shifts to the Goal argument.

6.3. ‘Split’ control

Until now, it was only noted cursorily that for certain control verbs, the ‘Source’ and the ‘Recipient’ argument can jointly control the PRO subject of the infinitival argument. This type of ‘split’ control becomes clearer when the interpretation of the infinitive requires a plural subject. This interpretation can be forced by adding an element such as *together* to the infinitive as in (42).

- (42) Kim_i offered/ promised/ asked Sandy_j PRO_{i+j} to go to the movies together

Verbs of variable control and preferential subject or object control seem to allow for ‘split’ control as well. This observation should not come as a surprise: since both arguments are lexically embedded in ‘unrealized’ subevents, both are available for control, in compliance with ARCA. A.

It is more surprising that some verbs of the *force* type expressing ‘influence’ also allow for ‘split’ control if the infinitive requires a plural interpretation for its subject. These data have hitherto gone unnoticed in the literature. There is a minimal contrast between the (b) sentence of (43), which do not allow for ‘split’ control, and the (b) sentences of (44--46), which do:

- (43) a. Kim_i told/ coerced Sandy_j [PRO_{*i/ j} to do the dishes]
 b. Kim_i told/ coerced Sandy_j [PRO_{*i+j} to do the dishes together]
 (44) a. Kim_i forced Sandy_j [PRO_{?i+j} to do the dishes together]
 b. Kim_i cajoled Sandy_j into PRO_{i+j} doing the dishes together]
 (45) a. Kim_i made Sandy_j get used to PRO_{i+j} doing the dishes together]
 b. Kim_i nagged/ browbeat Sandy_j [PRO_{i+j} to do the dishes together]

- (46) a. Kim_i convinced/ persuaded Sandy_j [PRO_j/*_i to do the dishes]
 b. Kim_i convinced/ persuaded Sandy_j [PRO_{i+j} to do the dishes together]

The difference between the verbs in (43) and those in (44--46) is that the exertion of influence over the Patient argument *Sandy* is progressive and spread out over time in verbs such as *cajole*, *nag* or *persuade*, while the way in which influence is exerted over the Patient in verbs such as *tell* or *coerce* is punctual and immediate. The relevant generalization thus seems to be that ‘split’ control is possible if the matrix verb expresses ‘progressive’ exertion of influence over the Patient. Importantly, these cases irrefutably demonstrate the interaction between lexical aspect and control, which is the main thesis of this chapter.

How can these cases of ‘split’ control be explained by the subevent structure of the verbs involved? More in particular, a representation in terms of subevent structure should explain why the ‘Agent’ argument of object control verbs only becomes available for control if the infinitive requires a plural interpretation. I would like to propose that ‘progressive’ object control verbs such as *cajole*, *nag* or *persuade* only differ from ‘punctual’ object control verbs such as *tell* or *coerce* by the nature of the first subevent. First of all, the first subevent of *cajole*, *nag* or *persuade* involves a Process, while the first subevent of *tell* or *coerce* is punctual. This reflects the idea that the relation between Patient and Theme is brought about progressively by the Agent in verbs such as *cajole*, *nag* or *persuade*. The relevant representations are thus as in (47) and (48):

- (47) a. Kim_i nagged/ cajoled/ persuaded Sandy_j [PRO_{i+j} to do the dishes together]
 b. [T [P e₁ ... e_n] P act (Kim, (Sandy, do dishes)) e_{n+1} do dishes (Sandy)]T
 (48) a. Kim_i told/ coerced Sandy_j [PRO*_i /j / *_{i+j} to do the dishes together]
 b. [T e₁* act (Kim, (Sandy, do dishes)) e_{n+1} do dishes (Sandy)]T

These representations now allow for an explanation of ‘split’ control. In order to do so, the definition of ‘unrealized’ subevent in (9) above needs to be expanded to include Process subevents. This is not unintuitive, since the Process subevent contains an undefined final subevent e_n, which refers to the fact that Processes are ‘not yet realized’. If this extension is granted, the [- realized] Process subevent becomes available for coindexation with the [- realized C° head of the infinitive. Notice however that such coindexation makes both arguments of the verb jointly available for control. In other words, AGR_S° cannot pick an argument in the Process subevent at its convenience: coindexation of C° with the Process subevent forces coindexation of AGR_S° with both arguments embedded in that subevent. As a result, coindexation of C° with the Process subevent will only come about if the infinitive accommodates a plural interpretation for its subject. In all cases where a singular interpretation for the infinitive is possible, coindexation of C° will only be possible with the second [- realized] subevent, e_{n+1} in (47--48). The analysis thus explains rather elegantly why the ‘Agent’ argument of object control verbs is only available for control if the infinitive requires a plural interpretation.

7. CONTROL IN INFINITIVAL SUBJECTS AND ADJUNCTS

The behaviour of infinitival subjects in subject and adjunct sentences has not yet been addressed.¹⁵ In these cases, infinitives are not complements of the verb and hence lack theta-marking. As a result, there is no Binding domain for the infinitival AGR_S° . In these cases, it is expected that the infinitival clause will not only act as a barrier for extraction, but also for Binding. In principle, this would mean that the infinitival AGR_S° cannot be bound at all, contrary to fact. To gain a better understanding of the behavior of anaphoric AGR_S° in contexts where no Binding domain is available, it is useful to look at the behavior of other anaphors in contexts where they have no access to an appropriate Binding domain.

Burzio (1992) and Pica (1987, 1991) propose that the absence of ϕ features is a morphological defining property of anaphors. Burzio (1992) moreover proposes that impersonal *si* ‘self’ in Italian is equally featureless, but lacks an antecedent since there is no governing category for it. Burzio (1992) proposes that impersonal *si* ‘self’ therefore receives a ‘default’ first person plural interpretation as in (49a). The impersonal *si* ‘self’ can however also refer to third person if context is supplied (49b).

- (49) a. *Si è contenti in Italia*
 SELF is happy_{PL} in Italy
 ‘One is happy in Italy’
 b. *Tutti lo dicevano. Si è contenti in Italia*
 All it_{cl} said. SELF is happy_{PL} in Italy
 ‘Everyone said it. One is happy in Italy’

I would like to claim that the same is true for anaphoric AGR_S° in sentential subjects and infinitival adjuncts. In the cases where the infinitival clause is a complement of a matrix verb, the infinitival anaphoric AGR_S° is bound in its Binding domain, the matrix clause. In sentential subjects and infinitival adjuncts, the anaphoric AGR_S° receives a ‘default’ 1st or second person interpretation, or a third person interpretation if context is supplied. The sentential subject in (50) is preferably interpreted as our/ your making noise.

- (50) PRO making noise at midnight will frighten Sue

The fact that PRO in these sentences is preferably interpreted as first or second person has been pointed out by Thompson (1973:377) for adjectival arguments as in (51):

¹⁵ For the issue of quantified ‘arbitrary’ PRO, as in sentences such as (i), see Lebeaux (1984). Vanden Wyngaerd (1990, 1994) has shown that most cases of arbitrary control as in (ii) involve control by an unexpressed or empty argument.

- i. [PRO_i to know her] is [PRO_i to love her]
 ii. It is difficult (for X) [PRO_X to remain calm]

- (51) 'Bill, tearing up my new paper dolls was mean,' cried Sue

This referential property of PRO in sentential subjects has led Van Haaften (1982:118) to claim that arbitrary PRO in these cases cannot be interpreted as third person. Bresnan (1982:328) and Vanden Wyngaerd (1990:216) have pointed out that the infinitival subject can be interpreted as referring to a third person if context is supplied:

- (52) a. Tom felt sheepish. Pinching those elephants was foolish.
He shouldn't have done it
b. Frankly, I'm worried about Mary. What has she gotten herself into?
Don't get me wrong: I think it was fine to join the group. But getting
herself photographed with those starving wolves was dangerous.

It is important to underscore that control of the infinitival subject in all these cases is not subject to locality restrictions. Despite examples such as (52), it is striking that the unexpressed subject PRO in infinitival and gerundial subjects is preferably interpreted as a discourse first or second person referent. The same is true in infinitival adjuncts when the subject of the infinitive does not correspond to the matrix subject. Clark (1985) has claimed on the basis of (53) that control in infinitival adjuncts is subject to locality. However, it appears that this claim is based on a rule of prescriptive grammar stipulating that the subject of the matrix clause should be a controller in infinitival adjuncts and gerunds.^{16 17} When making abstraction of this prescriptive reflex, sentences such as those in (54) can be construed which show that a nonlocal argument can control the unexpressed subject of a lower adjunct if it is second person, or properly introduced in the discourse.¹⁸

¹⁶ Numerous exceptions to this prescriptive rule can be noted, see Harmer (1979) for French.

- i. Peu d'instants après avoir quitté l'autostrade, le ciel entier prit une teinte grise'
'A few moments after having left the highway, the entire sky took on a grey color'
P. Fisson, *Voyage aux horizons*, p. 58, quoted by Harmer (1979:146)
ii. 'Moreover, Ms. Tamposi said the search was begun by one of her assistants
Carmen DePlacido, acting director of the passport office, without
consulting her' (Robert Pear, *New York Times*, p. 1. Nov. 14, 1992

¹⁷ I will not go into the intricacies of control into purpose clauses. For a discussion of control into rationale and purpose clauses in terms of thematic hierarchies, see Faraci (1974), Nishigauchi (1984), and Jones (1985, 1988). For some criticism on the relevance of these thematic hierarchies for control, see Bach (1982) and Ladusaw & Dowty (1988). Within the logic of the analysis developed here, I assume that, purpose clauses being adjuncts, AGR-S° becomes pronominal and can in principle freely corefer with arguments of the matrix clause. This free coreference must in some way be further constrained by the semantics of purpose clauses. I will leave this problem for future research.

¹⁸ It should be added that the sentences in (54) receive quite diverging acceptability judgments from various speakers. The contrast between the sentences in (53) and (54) is more difficult to explain. Descriptively speaking, it seems that PRO in temporal adjuncts is subject to a constraint that has often been noted for the binders of so-called logophoric uses of anaphors, namely that the controller needs to be the 'subject of consciousness' or the 'speaker' (cf (54c) of the sentence (cf. Kuno 1972, Zribi-Hertz 1989, Tancredi 1997). Clearly, the starred sentences in (53) correspond to cases in which the controller cannot be construed as the 'subject of consciousness'. I will not go into this problem here.

- (53) a. John felt old after seeing himself/ *oneself in the mirror
 (= Clark 1985:292(55))
 b. John kissed Mary after seeing himself/ *herself in the mirror
 (= Clark 1985:293(57))
 c. Mary thought that Bill had died after seeing *herself/ himself in the mirror
- (54) a. So you think now that Bill might have died right after
 shaving yourself on June 6. Why would that be?
 b. We have interviewed several people living in the neighborhood
 of the robbed bank. One person claimed the bank was attacked
 right after shaving himself at eight o'clock.
 c. Bill will only come home after calling him repeatedly
 d. Mr Freckletweeter_i was a very disorderly person at times. I_j see
 you_k have realized now that without PRO_{i/j/k} classifying them properly,
 his_i's papers would have been irremediably lost for posterity.

The interpretation of impersonal *si* 'self' in (49) is very close to the preferential interpretation of PRO in subject sentences and infinitival adjuncts: in both cases, the interpretation of the subject involves a discourse referent, but it can refer to third person given an appropriate context. The reflexive/ impersonal *si* 'self' and the AGR_S[°] in subject sentences and infinitival adjuncts also share a syntactic context: in both cases, the anaphor does not have a governing category. I will assume here that gerunds and infinitives have the same type of anaphoric AGR_S[°]. The similarity between the overt reflexive/ impersonal *si* 'self', and the infinitival AGR_S[°] warrants an analysis of this infinitival AGR_S[°] along the same lines: the infinitival AGR_S[°] is anaphor which can receive a 'default' pronominal interpretation if there is no governing category for it.

The fact that the infinitival AGR_S[°] takes on a 'default' pronominal interpretation in subject infinitival sentences predicts that there should be a difference between control of PRO in base-generated subjects and control in derived subjects. Subject sentences that originate as complements must at least allow for anaphoric control by an argument of the matrix verb, whereas base-generated sentential subjects only allow for pronominal control. Since pronominal control can pick up any NP in the context, this type of control easily masks anaphoric control. The only way to tell pronominal control and anaphoric control apart in these cases is that only pronominal control is subject to the discourse restrictions discussed above: the 'default' pronominal' interpretation of AGR_S[°] is restricted to 1st and 2nd person, 3rd person antecedents need to be discursively introduced, as noted in (51-52) above. Such a restriction does not apply to anaphoric control in complement sentences.

The difference between anaphoric and pronominal control introduced by the above analysis allows for an explanation of some long standing problems with respect to restrictions on the reference of PRO in untensed subject sentences of Psych- predicates. It has often been noted that the subject-contained PRO in (21) must be bound by the Experiencer object:

- (55) Playing/ to play basketball is fun for/ pleases/ disturbs John

The untensed subject sentence is never interpreted as the playing of some unspecified person. Notice, however, that pronominal control is not excluded. Pronominal control is possible if the controller is properly introduced in the discourse:

- (56) a. We_i thought that [PRO_i to play/ playing] basketball
may be fun for/ please/ disturb John
b. John_i thought that PRO_i to play/ playing basketball might
be fun for / please/ disturb us.

The interpretation of (55) with the ‘Experiencer’ object then certainly cannot involve pronominal control. If (55) involved pronominal control, it should involve the discourse restrictions noted above on pronominal control of third person coreferents. Since (55) is perfectly acceptable out of context, it must involve anaphoric control. The problem then arises as to how this can be the case: at first sight, the ‘Experiencer’ antecedent which binds the anaphoric AGR_S^o contained in the untensed subject sentence, is not located in the immediately superordinate binding domain of the infinitive, and does not c- command it.

Vanden Wyngaerd (1990) points out that an analysis of Psych- predicates such as the one proposed by Belletti & Rizzi (1988) or Pesetsky (1990, 1994) allows for an explanation of these anaphoric control properties. Belletti & Rizzi (1988) analyze Psych- predicates as unaccusative verbs where the surface subject is base-generated as a complement Theme. Psych- verbs then are projected as follows:

- (57) a. [[V Theme] Experiencer]
b. [[please [to play basketball]] John]

Vanden Wyngaerd (1990) then assumes that the anaphor PRO may be bound by the c-commanding Experiencer argument when the untensed complement containing PRO is in its base position. Consequently, anaphoric control is possible. Similarly, in the analysis developed here, the infinitival anaphor AGR_S^o contained in the untensed complement has the matrix clause of the Psych verb as its governing category. Crucially, however, control by the Experiencer in the matrix clause is possible because of the lexical coindexation of the infinitival C^o with the Stative [- realized] event of the matrix verb. Since Psych- predicates are stative verbs, their event structure is [-realized] since it is not linked to a specific point on the time axis (cf. the definition in (9a)). The agentive predicate inside the subevent structure translates the fact that the Theme of Psych- verbs is causative (cfr Pesetsky 1990 for discussion):

- (58) [S e_n act (playing/ to play basketball, John)]S

The Stative event with which the infinitival C^o is coindexed then is temporally [- realized] in the sense of (9a). Since the [-realized] infinitival C^o, or the [-realized] tense of a gerund, are coindexed with an aspectually [-realized] event in which the Experiencer is lexically

represented, this Experiencer can bind the infinitival AGR_S° without giving rise to a coindexing conflict in the infinitival C° - AGR_S° - T° complex.

But this is not all. Anaphoric control is not the only possibility for the AGR_S° contained in the untensed complement of Psych- predicates. Moving the untensed sentence to subject position affords its anaphoric AGR_S° another option: anaphoric AGR_S° can receive a pronominal default interpretation at LF, since it has no governing category. This explains the cases of pronominal control in (56). In other words, Psych verbs allow both anaphoric and pronominal control of the infinitival AGR_S° contained in the subject infinitival sentence. Anaphoric control is determined in the base position of the infinitive, while pronominal control is fixed in the derived subject position that the infinitive ends up in.

In Minimalist terms (Chomsky 1995), this situation resembles that of the cases in (59). Chomsky (1995) argues that LF movement of *self* (LF cliticization or CL_{LF}) out of the *Wh*- NP in SpecCP accounts for the fact that the anaphor can be bound by the matrix subject in (59), while reconstruction of the anaphoric part of the *Wh*- NP downstairs accounts for the reading in which the anaphor is bound by the embedded subject.

- (59) John_i wondered [which pictures of himself_{i/j}] Bill_j saw t
(=Chomsky 1995:Ch 3(36))

The difference between anaphoric control and pronominal control in the case of Psych verbs can be viewed in a similar way: anaphoric control is obtained by reconstruction of the anaphoric part of the infinitival CP (the anaphoric AGR_S°) in complement position of the Psych-verb, while pronominal control is obtained by interpreting the anaphoric AGR_S° inside the infinitival CP upstairs, where it will receive a ‘default’ pronominal interpretation because of the lack of a higher binding domain.

The difference between anaphoric and pronominal control in the case of Psych-verbs now explains why the following sentence is awkward:

- (60) * PRO_i shaving himself_i is fun for/ pleases/ disturbs John_i's girlfriend

It has been observed by Mohanan (1983:671) that this type of sentences is ungrammatical if *John* is not previously introduced in the discourse, and grammatical if *John* is discursively salient.¹⁹ This discourse restriction suggests that pronominal control is involved. In fact, anaphoric control with *John* as the antecedent for the anaphoric infinitival AGR_S° is excluded, since the controller *John* does not c- command the infinitival anaphor AGR_S° , and since the controller is not an argument occurring in the subevent structure of the

¹⁹ Note that within a single sentence, nominal constructions can introduce coreferential arguments in the discourse when their head noun is not animate. This is also true for derived and nonderived subject sentences:

- i. Shaving himself would be good for John's career/ *friends
- ii. To behave himself in public would help Bill's development/ *friends

matrix verb. The AGR_S° contained in the sentential subject in (60) can only corefer with *John* through its ‘default’ pronominal interpretation.

Finally, the analysis of pronominal and anaphoric control with Psych- predicates proposed here can solve some issues in the long standing debate over Super Equi-NP deletion (Grinder 1970, 1971; Kimball 1971). In fact, the analysis predicts that leaving the sentential complement in its base position only allows for anaphoric Binding of the infinitival AGR_S° by the matrix ‘Experiencer’, since in that case the untensed sentential complement has the matrix clause as its governing category. This prediction is carried out. Grinder (1970:301) notes that impersonal constructions of Psych- verbs do not allow for what he calls Super-Equi, namely control by the subject of the superordinate clause:

- (61) a. Harry_i believes that [PRO_i to make a fool of himself
in public] disturbed/ pleased Sue
b. * Harry_i believes that it disturbed/ pleased Sue
[PRO_i to make a fool of himself in public]
c. Harry_i believes that it disturbed/ pleased Sue
[PRO_i to make a fool of herself in public]

Grinder (1970) explains these sentences in terms of the Intervention Constraint. Adapted to modern usage, this constraint stipulates that control between *Harry* and PRO in (61b) is blocked because of the intervening possible controller *Sue*.²⁰

In the analysis adopted here, the untensed sentential complement in (61b) is in its base position where it is L- marked by the matrix verb. If the sentential complement in (61b) were extraposed from a subject position to some A' position, ECP violations are expected with respect to extraction. This is not the case; extraction out of the sentential complement is fine, as illustrated in (62):

- (62) This is the kind of good cause which it never bothers/
always pleases Sue to give money to

Extraction shows that the sentential complement is not an extraposed subject in an A' position. The complement CP is not a barrier to extraction because it is L- marked by the matrix Psych- verb. The impersonal construction of Psych- verbs only allows for anaphoric Binding of the infinitival AGR_S° in its governing category, the matrix clause, as in (61c). Coindexing AGR_S° with the subject of the superordinate clause in (61b) is incompatible with its anaphoric nature. This indexing is perfectly possible as the result of pronominal control when the untensed complement has moved to subject position as in (61a).

Now let us compare the sentences in (61) with the following:

²⁰ See also Jacobson & Neubauer (1976) and Chierchia & Jacobson (1986) for discussion.

- (63) a. Harry_i believes that PRO_i behaving himself in public would help Sue_j
 b. Harry_i believes that it would help Sue_j PRO_i to behave himself in public
 c. Harry_i believes that it would help Sue_j PRO_j to behave herself in public

Interestingly, control by the subject of the superordinate clause seems to be possible in the impersonal construction (63b), which minimally contrasts with (61b). The sentence (63b) then is an exception to Grinder's (1976) Intervention Constraint: *Sue* is a possible controller in (63b), as evidenced by (63c), but the fact that this NP intervenes between *Harry* and PRO does not prevent control of PRO by *Harry*. In the analysis developed here, the control properties exemplified in (63) seem to indicate that pronominal control is involved. Arguably, the untensed sentential subject in (63a) is base generated as a subject sentence. As a result, anaphoric control is impossible, since the infinitival AGR_S[°] is never governed by the matrix verb. Moreover, the anaphoric AGR_S[°] does not have a governing category in which it can be bound at any level of representation. The only remaining possibility then is pronominal control: the anaphoric AGR_S[°] receives a 'default' pronominal interpretation and can corefer freely. This analysis is again sustained by extraction phenomena. Extraction out of the untensed sentences construed with verbs such as *help* gives rise to ECP violations:

- (64) * This is the kind of good cause which it often helps Sue to give money to

These extraction phenomena show that the infinitive in (63-64) is a barrier to extraction, a sentential complement that is not L- marked by the matrix verb, and that it is extraposed from its base generated subject position to an A' position. Since the extraposed subject involves a barrier, the matrix clause cannot function as the governing category for the infinitival AGR_S[°]. The anaphoric infinitival AGR_S[°] does not have a governing category and as a result receives a 'default' pronominal interpretation.

8. CONCLUSION: 'OUT OF CONTROL'

The lexical residue of control theory can be derived given an explicit theory of event structure which interacts with other modules of the grammar: government-selection of C[°], Maximal Identification of features, Binding of the infinitival AGR_S[°] in the matrix clause. The interaction between the semantic contents of both the infinitival morphology and the matrix verb is crucial to a proper understanding of control. The temporal interpretation of infinitives, which is determined by the matrix verb, constrains the Binding possibilities of the anaphoric subject of infinitives in their Binding domain. In other words, the selectional mechanisms which determine the temporal interpretation of an infinitive also determine control of this infinitive. Subcategorization of the infinitival C[°] by the matrix control V[°] should be viewed as an instance of semantic identification of the [- realized] temporal features in C[°] with the [- realized] subevents represented in the event structure of the matrix control verb. This allows for restricting the set of possible controllers to the object of object control verbs and to both the subject and the object in variable (*propose*) and preferential (*promise/ ask*) control verbs.

It was shown that the grammar needs a lexical specification of aspectual information under the form of lexical event structures along the lines of Pustejovsky (1988). Semantic properties which are relevant in the syntax must be lexically represented. The lexical representation of arguments is mediated through lexical aspect. The analysis of control presented here provides evidence for Tenny's (1987, 1988) Aspectual Interface Hypothesis which states that aspectual structures mediate the mapping between thematic structures and syntactic structures.

References

- Abraham, Werner. 1982. Zur Kontroll im Deutschen. Groningen Arbeiten zum germanistischen Linguistik. 1.112-167.
- Abraham, Werner. 1983. The control relation in German. On the Formal Syntax of the Westgermania, ed. by Werner Abraham, 217-242, N.Y.: John Benjamins.
- Belletti, Adriana 1990. Generalized verb-movement. ms. Université de Genève - Scuola Normale Superiore Pisa.
- Boguslawski, Andrzej. 1983. An analysis of *promise*. Journal of Pragmatics. 7.607-628.
- Borer, Hagit. 1989. Anaphoric AGR. The null subject parameter, ed. by Osvaldo Jaeggli and Kenneth Safir, 69-110. Dordrecht: Kluwer.
- Bouchard, Denis. 1985. PRO pronominal or anaphor ? Linguistic Inquiry. 16.471-477.
- Bresnan, Joan. 1972. Theory of complementation in English syntax. Ph.D. dissertation, Cambridge: MIT.
- Burzio, L. (1992) 'On the morphology of reflexives and impersonals' in C. Laeufer and T. Morgan (eds), Theoretical analyses in Romance linguistics, LSRL XIX, Amsterdam: John Benjamins.
- Chierchia, G. & P. Jacobson (1986) 'Local and long distance control', Proceedings of NELS 16, 57--74.
- Chomsky, Noam. 1965. Aspects of the theory of syntax. Cambridge: The MIT Press.
- Chomsky, Noam. 1981. Lectures on government and binding. Dordrecht: Foris.
- Chomsky, Noam. 1986. Knowledge of language. New York: Praeger.
- Chomsky, Noam & Howard Lasnik. 1991. Principles and parameters theory. to appear in: J. Jacobs, A. von Stechow, W. Sternefeld and T. Vennemann (eds), Syntax: an international handbook of contemporary research. Berlin: de Gruyter.
- Clark, Robin. 1985. Boundaries and the treatment of control. Ph. D. dissertation. Los Angeles: UCLA.
- Dowty, David. 1991. Thematic proto-roles and argument selection. Language 67.547-619.
- Foley, William, and Robert van Valin, Jr. 1984. Functional syntax and universal grammar. Cambridge: Cambridge University Press.
- Grinder, J. (1970) 'Super Equi-NP deletion', Papers from the sixth meeting of the Chicago Linguistics Society, 297--317.
- Grinder, J. (1971) 'A reply to Super Equi-NP deletion as dative deletion', Papers from the seventh meeting of the Chicago Linguistics Society, 101--111.
- Gross, Maurice. 1975. Méthodes en syntaxe. Paris: Hermann.

- Guillaume, Gustave. 1929. *Temps et verbe*. Paris: Masson.
- Hale, Ken & Jay Keyser. 1990. Ch.1 The syntactic character of thematic structure, Ch.2 On some problems of methods and determination of lexical relational structures. Ch. 3 Categories and projections. (ms.) Cambridge: MIT.
- Higginbotham, J. (1989) 'Reference and control', R. Larson, S. Iatridou, U. Lahiri and J. Higginbotham (eds), *Control and Grammar*, Dordrecht: Kluwer, 79--108.
- Huot, Hélène. 1981. *Constructions infinitives du français: le subordonnant de*. Genève-Paris: Droz.
- Jackendoff, Ray. 1972. *Semantic interpretation in generative grammar*. Cambridge (Mass.): The MIT Press.
- Jackendoff, Ray. 1987. The status of thematic relations in linguistic theory. *Linguistic Inquiry*. 18.369-411.
- Jacobson, P. & P. Neubauer (1976) 'Rule cyclicity: evidence from the intervention constraint', *Linguistic Inquiry* 7: 429--462.
- Kayne, Richard. 1981. On certain differences between French and English. *Linguistic Inquiry*. 12.349-371.
- Kayne, Richard. 1990. Romance clitics and PRO. *Proceedings of NELS 20*. Amherst: GLSA.
- Keenan, Edward. 1976. Towards a universal definition of 'subject'. *Subject and topic*, ed. by Charles Li, 303-334. New York: Academic Press.
- Keenan, Edward. 1984. Semantic correlates of the ergative/absolutive distinction, *Linguistics*. 22.197-223.
- Kimball, J. (1971) 'Super Equi-NP Deletion as Dative deletion', *Papers from the seventh meeting of the Chicago Linguistics Society*, 142--148.
- Koster, Jan. 1984. On binding and control. *Linguistic Inquiry*. 15.417-459.
- Larson, Richard. 1990. *Promise* and the theory of control. *Linguistic Inquiry*. 21.103-140.
- Lebeaux, David. 1984. Anaphoric binding and the definition of PRO. *Proceedings of NELS 14*, ed. by Charles Jones and Peter Sells, 253-274. Amherst: GLSA.
- Long, Mark. 1974. French infinitival complementizers and their place in a generative grammar. *Current Studies in Romance Linguistics*, ed. by Marta Luján and Fritz Hensey, 205-220. Washington: Georgetown University Press.
- Lyons, John. 1977. *Semantics*. Cambridge: Cambridge University Press
- Manzini, M. Rita. 1983. On control and control theory. *Linguistic Inquiry*. 14.421-467.
- Mohanan, K. (1983) 'Functional and anaphoric control', *Linguistic Inquiry* 14: 641—674
- Palmer, F. R. 1974. *The English verb*. London: Longman.
- Pesetsky, D. (1990) 'Experiencer predicates and universal alignment principles', ms., Cambridge: MIT
- Pesetsky, D. (1994) *Zero syntax*. Cambridge: The MIT Press.
- Pica, P. (1987) 'On the nature of the reflexivization cycle', in J. McDonough and B. Plunkett (eds), *Proceedings of NELS 17*, Amherst: GLSA, 483--500.

- (1991) 'On the relationship between binding and antecedent-government: the case of long-distance reflexives', in J. Koster and E. Reuland (eds), *Issues in long-distance anaphora*, Cambridge: Cambridge University Press, 119-135.
- Pollock, Jean-Yves. 1989. Verb movement, universal grammar, and the structure of IP. *Linguistic Inquiry* 20.365-424.
- Postal, Paul. 1970. On coreferential complement subject deletion. *Linguistic Inquiry*. 1.439-500.
- Pustejovsky, James. 1988. The geometry of events. *Studies in generative approaches to syntax*. ed. by Carol Tenny, 19-40. *Lexicon Project Working Papers* 24. Cambridge MA: MIT.
- Rosenbaum, Peter. 1967. *The grammar of English predicate complement constructions*. Cambridge (Mass.): The MIT press.
- Rooryck, Johan. 1987. *Les verbes de contrôle: une analyse de l'interprétation du sujet non exprimé des constructions infinitives en français*. Doctoral dissertation: K.U.Leuven.
- Rooryck, Johan. 1993. *Out of Control*. Deriving the reference of unexpressed infinitival subjects. (book ms., Indiana University)
- Rudanko, Juhani. 1985. Towards classifying verbs governing object-controlled infinitival Equi in Modern English. *Studia Neophilologica*. 57.145-155.
- Rudanko, Juhani. 1989. *Complementation and case grammar*. Albany: SUNY Press.
- Ruzicka, Rudolf. 1983a. Autonomie und Interaktion in Syntax und Semantik. *Untersuchungen zur Semantik*, *Studia Grammatica* XXV. ed. by Rudolf Ruzicka and Wolfgang Motsch, 15-60. Berlin: Akademie Verlag.
- Ruzicka, Rudolf. 1983b. Remarks on control. *Linguistic Inquiry*. 14.309-324.
- Siebert-Ott, Gesa. 1983. *Kontroll-Probleme in infiniten Komplementkonstruktionen*. Tübingen: Gunter Narr Verlag.
- Sag, Ivan & Carl Pollard. 1991. An integrated theory of complement control. *Language* 67.63-113.
- Searle, John. 1969. *Speech acts: an essay in the philosophy of language*. Cambridge: Cambridge University Press.
- Siebert-Ott, Gesa. 1985. Bemerkungen zu den Elementen einer Theorie der Kontrolle. *Erklärende Syntax des Deutschen*, ed. by Werner Abraham, 255-270. Tübingen: Gunter Narr Verlag.
- Stowell, Tim. 1981. *Origins of phrase structure*. Ph. D. dissertation, Cambridge, MIT.
- Stowell, Tim. 1982. The tense of infinitives. *Linguistic Inquiry* 13:561-570.
- Tenny, Carol. 1987. *Grammaticalizing aspect and affectedness*. Ph. D. dissertation: Cambridge MA: MIT.
- Tenny, Carol. 1988. The aspectual interface hypothesis: the connection between syntax and lexical semantics. *Studies in generative approaches to syntax*. ed. by Carol Tenny, 1-19. *Lexicon Project Working Papers* 24: MIT.
- Vanden Wyngaerd, Guido. 1994. *PRO-legomena*. Distribution and reference of infinitival subjects. Berlin: Mouton De Gruyter.

- Vendler, Zeno. 1967. *Linguistics and philosophy*. Ithaca: Cornell University Press.
- Visser, Fredericus. 1972. *An historical syntax of the English language*. Part 2. Syntactical units with one verb. Leiden: E.J. Brill.
- Visser, Fredericus. 1973. *An historical syntax of the English language*. Part 3. second half. Syntactical units with two and with more verbs. Leiden: E.J. Brill.
- Visser, Fredericus. 1978 (1969¹). *An historical syntax of the English language*. Part 3. first half. Syntactical units with two verbs. Leiden: E.J. Brill.
- Wegener, Heide. 1989. 'Kontrolle' semantisch gesehen. *Zur Interpretation von Infinitivkomplementen im Deutschen*. *Deutsche Sprache*. 206-228.
- Wierzbicka, Anna. 1987. *English speech act verbs: a semantic dictionary*. Sidney: Academic Press.