

# Syntactic vs. Semantic Control

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## Abstract

This paper investigates the interaction of the syntax and semantics of infinitival constructions. It is argued that there is a close connection between the syntactic structure (the presence vs. absence of an infinitival PRO subject) and the interpretation (obligatory vs. non-obligatory control) of infinitival constructions. The main claim is that obligatory control is determined lexically/semantically, whereas non-obligatory control is determined syntactically. While obligatory control is compatible with a subjectless (i.e., PRO-less) infinitive, non-obligatory control requires the presence of a syntactic PRO subject. Empirical evidence for the absence vs. presence of a syntactic PRO subject comes from the A-movement (restructuring) and binding properties in infinitival constructions. Finally, binding and the interpretation of *it*-anaphors shows that the correlation between obligatory control and the lack of a syntactic subject is only a one-way correlation and that the syntactic structure cannot be fully reduced to the semantic properties.

## 1. Introduction

The question of whether control infinitives include an embedded syntactic (PRO) subject (which goes hand in hand with the question of whether infinitives are clauses or smaller predicates) has been a longstanding issue in both the syntactic as well as the semantic literature. The common approach in the 80s was that control infinitives are clauses (IPs or CPs) syntactically and propositions semantically.<sup>1</sup> One of the main reasons for the clausal nature of control infinitives in these theories had to do with the idea of uniformity of phrase structure. Since certain control infinitives can involve overt CP-material, control infinitives were generally considered to be clauses (whether they involve CP-material or not). The so-called *PRO-theorem* provided another theory-internal reason for a clausal structure of control infinitives. Since Chomsky's *Lectures on Government and Binding*, PRO has been assigned a special status—it is both anaphoric and pronominal. To avoid violations of binding theory, PRO had to be ungoverned. A C-projection in control infinitives was then necessary to protect PRO from government by the matrix verb. Finally, assuming that control infinitives are interpreted as propositions (but see below for a different view), the *Projection Principle*, which states that an argument is present at all levels of representation, requires the presence of a (PRO) subject in the syntactic structure.

A unified account for (all) control infinitives, however, has also been challenged in a variety of works on infinitives. On the one hand, with the development of a Case-theoretic account of PRO (Chomsky & Lasnik 1993, Martin 1996) one of the major theoretical motivations for a

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1. Throughout this paper, we will use the term *proposition* to refer to a clause/predicate including a subject (i.e., a predicate that does not have an unsaturated subject position).

CP-structure for control infinitives disappears. Many contemporary syntactic approaches assume that complementizerless and non-*wh*-infinitives are smaller categories. To take just one approach, Bošković (1996, 1997) argues that control infinitives are IPs, while maintaining the idea that control infinitives project an embedded PRO subject which is present in the syntactic representation. On the other hand, considering the semantic properties of different infinitival constructions, many works have shown that a uniform treatment of all control infinitives seems untenable. Rochette (1988), for instance, proposes that the size of an infinitive corresponds to its semantic category: CP-infinitives denote *propositions*, IP-infinitives denote *events*, and subjectless VP-infinitives denote *actions*. In standard *Lexical Functional Grammar* (LFG), control infinitives are considered as subjectless VPs in syntax and propositions in semantics (cf. Bresnan 1982). Similarly, Chierchia (1984a, 1984b) argues that control infinitives are properties—i.e., subjectless predicates—in syntax and semantics and become associated with a subject later on in context by means of a semantic control principle.

The main aim of this paper is to investigate the interaction of the syntax and semantics of infinitival constructions. While we will provide further support for Chierchia’s claim that (certain) infinitives are subjectless predicates syntactically and semantically, we will also conclude that the syntax and the semantics of infinitival constructions have their own lives, and that the syntactic properties cannot be fully reduced to the semantics of a given construction.

## 2. Obligatory vs. non-obligatory control

### 2.1 The classification of obligatory vs. non-obligatory control

Since Williams (1980), it has been widely accepted that the control phenomenon subsumes two sub-cases: *obligatory* and *non-obligatory* control. While most authors agree that these two forms of control have to be distinguished to account adequately for the properties of control constructions, the actual classification of infinitival constructions as obligatory vs. non-obligatory control infinitives is subject to some debate. To avoid confusion, we will first outline how we will use the obligatory vs. non-obligatory control distinction in this paper. The examples in (1) and (2) illustrate a number of control phenomena that have been distinguished in the literature. (1)a represents an instance of *exhaustive control* (cf. Landau 1999)—i.e., the infinitival subject refers exhaustively to the matrix subject *John*. Examples such as the one in (1)b from Kawasaki (1993) involve *arbitrary control*—i.e., the reference of the infinitival subject is left unspecified. (1)c is an instance of *implicit control*—i.e., the implicit argument of *difficult* functions as the controller of the infinitival subject (see Landau 1999 for arguments against an arbitrary control analysis for examples of this sort). (1)d involves *split control*—i.e., the infinitival subject is controlled jointly by the matrix subject and object. And (1)e, represents *partial* or *imperfect control*—i.e., the controller denotes a subset of the reference set of the infinitival subject (cf., Martin 1996, Petter 1998, Wurmbrand 1998a, 1998b, Landau 1999).<sup>2</sup>

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2. For many speakers, partial control is a marked interpretation, and there are also speakers that reject this from of control (see also Landau 1999 for a discussion of partial control in other languages and ways to facilitate this interpretation). The judgements and contrasts reported in this paper are from speakers that readily allow partial control.

- (1) a. *John tried to leave*  
 b. *It is dangerous for babies to smoke around them*  
 c. *It was difficult to leave*  
 d. *John persuaded Mary to leave together*  
 e. *We thought that the chair preferred to gather at 6*

Finally, the German examples in (2) represent the phenomenon of *control shift* or *variable control* which is found in many languages.<sup>3</sup> As is illustrated in (2)a, the infinitival subject can be associated with either the matrix subject or object. The availability of variable control depends on the type of predicate (see section 2.2), as well as certain thematic and pragmatic properties of the construction (see for instance Farkas 1988, Petter 1998, Landau 1999 for extensive discussions). As can be seen in (2)b for instance, constructions involving the verb *bitten* ‘ask’ allow control shift best when the infinitival predicate is passivized or involves a modal predicate—i.e., when the (surface) infinitival subject bears a non-agentive theta role (a similar effect has been noted in English for *promise*-constructions).

- (2) a. *Ich<sub>i</sub> habe ihm<sub>j</sub> angeboten [PRO<sub>i/j</sub> mich zu erschießen]*  
 I<sub>i</sub> have him<sub>j</sub>-DAT offered [PRO<sub>i/j</sub> me/myself to shoot]  
 ‘I offered him to shoot myself’  
 ‘I offered him that he could shoot me’  
 b. *Ich<sub>i</sub> habe ihn<sub>j</sub> gebeten [PRO<sub>i/?j</sub> erschossen zu werden]*  
 I<sub>i</sub> have him<sub>j</sub>-ACC asked [PRO<sub>i/?j</sub> shot to become]  
 ‘I asked him to allow/arrange that I get shot (by somebody)’  
 ?‘I asked him to allow/arrange that he get shot (by somebody)’

As far as we are aware, the classification of exhaustive control as in (1)a as obligatory control is uncontroversial. Similarly, arbitrary control as in (1)b is generally considered as the prototypical case of non-obligatory control. Concerning the examples in (1)c-e and (2), on the other hand, the classification is less straightforward. Like obligatory and unlike non-obligatory control infinitives, partial, split, and variable control constructions require an antecedent for the infinitival subject in the higher predicate (i.e., long distance or arbitrary control are prohibited). However, the antecedent does not necessarily fully coincide with the infinitival subject—it suffices that the antecedent is included in the reference set of the embedded subject. Unlike obligatory and like non-obligatory control, on the other hand, partial, split, and variable control do not involve a unique pre-determined controller but allow different possibilities for the interpretation of the infinitival subject. We will take this latter property to group partial, split, and variable control as part of non-obligatory control. Infinitives that in principle allow more than one interpretation of the embedded subject will be considered as non-obligatory control infinitives, whereas infinitives that—irrespective of the syntactic and pragmatic context—require a particular interpretation of the embedded subject will count as obligatory control infinitives.<sup>4</sup> We thus assume that the obligatory/non-obligatory control distinction is a basic semantic distinction.

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3. As has been noted by Comrie (1984), the possibility of control shift is subject to variation (both across and within languages).

4. This classification requires some clarification concerning implicit control. As we will see below, implicit control in impersonal *try*-constructions (i.e., constructions involving an exhaustive control predicate) and in examples such as (1)c (cf. Landau 1999) is no different from the control properties of the non-implicit versions of these constructions. That is, the antecedent of the infinitival subject is pre-determined as the implicit

Note that by grouping partial, split, and variable control with non-obligatory control, we do by no means claim that non-obligatory control is a homogeneous phenomenon or that all forms of non-obligatory control involve the same control mechanism. As discussed in detail in Landau (1999) there are very important syntactic and semantic differences between the different forms of non-obligatory control. In particular, as mentioned above, partial, variable, and split control differ from arbitrary and long-distance control in whether a local antecedent is required or not. In partial, variable, and split control constructions the embedded subject has to be associated (at least partially) with an antecedent in the matrix predicate (however, the antecedent is not pre-determined and can be variable), whereas no local antecedent is required in arbitrary and long-distance control constructions. Given this property, Landau (1999) argues that exhaustive, partial, split, and variable control are to be characterized as obligatory control and derived by the same control mechanism. According to Landau, the obligatory vs. non-obligatory control distinction is a syntactic rather than a semantic distinction: VP-internal infinitives trigger obligatory control, VP-external infinitives allow non-obligatory control. The exhaustive vs. partial control distinction, on the other hand, is based on a semantic difference: tenseless infinitives (e.g., infinitives combining with implicative predicates) yield exhaustive control, whereas tensed infinitives (desiderative and interrogative infinitives) allow partial control.

The main reason for why we consider the obligatory/non-obligatory control distinction a semantic distinction rather than a syntactic distinction is that in a number of contexts, the syntactic configuration and the tense properties are not sufficient to determine which form of control is possible, and additional lexical/semantic specifications are necessary to overrule the syntactic control properties. As Landau notes, certain predicates (e.g., *silly*, *kind*, *polite*, *irresponsible of*) require coreference between the complement of the adjective and the embedded subject, independently of the syntactic configuration these predicates appear in. Similarly, certain infinitival adjuncts (e.g., right-adjoined temporal adjuncts or purpose clauses) are specified for obligatory control although the syntactic properties would be compatible with a non-obligatory control interpretation (Uchiumi, p.c.). Finally, the tense properties do not fully correlate with the exhaustive/partial control distinction (see also Wurmbrand 1998b, in prep.). In particular, we will see below that certain tensed infinitives only yield exhaustive control and that not all desiderative predicates allow partial control (e.g., verbs like *order*, *permit* which combine with irrealis/tensed infinitives require exhaustive control). Hence, an additional lexical specification of obligatory control is necessary for a number of desiderative predicates that prohibit partial control.

While we take these lexical/semantic factors to reflect the basic obligatory/non-obligatory control distinction, we follow Landau in that the syntactic properties are crucial for the determination of non-obligatory control (in our sense). Thus, the difference mentioned above between partial, variable, and split control, on the one hand, and arbitrary and long-distance control, on the other hand, is the result of different syntactic configurations (e.g., whether the infinitive is

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argument of the matrix predicate and no other interpretation is possible. Given the implicit nature of the antecedent, there are of course different values that the implicit argument and hence the infinitival subject can receive, however, what is crucial is that there is no interpretation in which the infinitival subject and the implicit argument receive a different interpretation (at the same time). Implicit control in variable, split, or partial control constructions, on the other hand, does not involve a pre-determined antecedent (i.e., the infinitival subject does not have to coincide fully with any particular argument of the matrix predicate). Examples such as *Es wurde angeboten das Haus zu verkaufen* [lit.: It was offered to sell the house] involve two implicit matrix arguments, and a range of interpretations are possible (e.g., ‘X offered Y that Y could sell the house’, X offered Y that X would sell the house’). We thus assume that implicit control per se is neither obligatory nor non-obligatory control but that the control properties depend on the type of the matrix predicate.

VP-internal or VP-external) and hence different forms of control. Since our major concern here is the nature of the obligatory vs. non-obligatory control distinction as defined above and the question of where and how this distinction is established, we will not go into detail regarding the technical details of non-obligatory control but refer the reader to Landau (1999).

## 2.2 Two classes of infinitival constructions

While variable control (control shift) is quite readily available in German, there are nevertheless constructions that clearly block this form of control. As we have seen above, infinitives combining with verbs like *offer*, *ask* (also *propose*, *persuade*, *promise* etc.) allow either subject or object control (modulo certain thematic restrictions in the infinitive). Infinitives combining with verbs like *forbid*, *allow*, or *recommend*, on the other hand, do not have this option. As is illustrated in (3), these verbs prohibit any kind of flexible interpretation and only allow object control.

- (3) a. *Ich<sub>i</sub> habe ihm<sub>j</sub> verboten [SUBJ<sub>\*i/j</sub> mich zu erschießen]*  
*I<sub>i</sub> have him<sub>j</sub>-DAT forbidden [SUBJ<sub>\*i/j</sub> me/myself to shoot]*  
 ‘I forbade him to shoot me’  
 \*‘I forbade him that I should/could shoot myself’
- b. *Ich<sub>i</sub> habe ihm<sub>j</sub> verboten [SUBJ<sub>\*i/?j</sub> erschossen zu werden]*  
*I<sub>i</sub> have him<sub>j</sub>-DAT forbidden [SUBJ<sub>\*i/?j</sub> shot to become]*  
 ?‘I forbade him to allow/arrange that he get shot (by somebody)’  
 \*‘I forbade him to allow/arrange that I get shot (by somebody)’

Similarly, only a subgroup of infinitival constructions allows partial control. As has been noticed by Williams (1980), collective predicates such as *to meet*, *to gather*, *together* (i.e., predicates that require a plural subject or associate) can occur in certain infinitival constructions that involve a singular controller in the matrix predicate (cf. his examples in (4)a vs. (4)b).

- (4) a. \**I will try to meet at 6*  
 b. *I decided to meet at 6*

Looking at a range of infinitival constructions, we find again that some infinitival constructions allow partial control (cf. the examples in (5)), whereas others block this form of interpretation (cf. the examples in (6)). As is illustrated in (5)a, constructions with variable control verbs (such as *propose*), not only allow subject and object control but also allow partial subject and object control (“k” refers to referents that are provided by the context).

- (5) a. *Der Direktor<sub>i</sub> hat ihm<sub>j</sub> vorgeschlagen [PRO sich im Schloß zu versammeln]*  
 The principal<sub>i</sub> has him<sub>j</sub> proposed [PRO SELF in-the castle to gather]  
 ‘The principal proposed to him to gather in the castle’  
 PRO<sub>i</sub>, PRO<sub>j</sub>, PRO<sub>i+k</sub> (e.g., the teachers), PRO<sub>j+k</sub> (e.g., the students), PRO<sub>i+j+k</sub>  
 (e.g., the whole school)
- b. *Er<sub>i</sub> beschloß/erwog/plante [PRO<sub>i+k</sub> sich im Schloß zu versammeln]*  
 He<sub>i</sub> decided/contemplated/planned [PRO<sub>i+k</sub> SELF in the castle to gather]  
 ‘He decided/contemplated/planned to gather in the castle’
- c. *Hans<sub>i</sub> beschloß/erwog/plante [PRO<sub>i+k</sub> sich gemeinsam zu bewerben]*  
 John<sub>i</sub> decided/contemplated/planned [PRO<sub>i+k</sub> SELF together to apply]  
 ‘John decided/contemplated/planned to apply together’

- (6) a. \**Der Bürgermeister wagte/versuchte/begann/vergass*  
 The mayor dared/trying/began/forgot  
 [*sich im Schloß zu versammeln*]  
 [SELF in the castle to gather]  
 ‘The mayor dared/trying/began/forgot to gather in the castle’
- b. \**Es ist ihm gelungen* [*sich im Schloß zu versammeln*]  
 It is him managed [SELF in the castle to gather]  
 ‘He managed to gather in the castle’
- c. \**Der Beamte hat ihm verboten/erlaubt/empfohlen*  
 The clerk has him disallowed/allowed/recommended  
 [*sich gemeinsam zu bewerben*]  
 [SELF together to apply]  
 ‘The clerk disallowed/allowed/recommended (to) him to apply together’

Thus, variable and partial control split infinitival constructions into two groups which we labeled obligatory vs. non-obligatory control. The interesting question that arises from this distinction is why there is such a distinction and what it tells us about the grammar of infinitival constructions.

### 3. Syntactic vs. semantic control

#### 3.1 Main proposal

The numerous works on the obligatory vs. non-obligatory control distinction have identified a number of properties that distinguish the two forms of control (see in particular Williams 1980, Manzini 1983, Lebeaux 1984, 1985, Hornstein 1999, Landau 1999).<sup>5</sup> In obligatory control constructions, the antecedent is thematically or grammatically uniquely determined, the antecedent is obligatory, there are strict locality constraints on the relation between the antecedent and the embedded subject, only a sloppy interpretation is available under ellipsis, and only a *de se* interpretation is possible for the embedded subject. In non-obligatory control constructions, none of these properties has to hold. What the various obligatory control properties have in common is that obligatory control involves a very tight relation (both structurally and semantically) between the antecedent and the infinitival subject. The major aim of obligatory control analyses is thus to derive this close relation between the infinitival subject and the antecedent. Possibly the most common way to do so is by assuming that obligatory control expresses an anaphoric relation (cf. Manzini 1983, Bouchard 1984, Koster 1984, Borer 1989). A different approach is that obligatory control is a (very local) agreement relation (cf. Landau 1999). Finally, the most recent proposals reduce the effects of obligatory control to the claim that the antecedent and the embedded subject are one and the same element which occurs in two positions—i.e., obligatory control is analyzed on a par with raising (O’Neil 1997, Hornstein 1999, Manzini & Roussou 2000). In contrast, non-obligatory control is subject to looser conditions, which is generally attributed to the pronominal

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5. Some of the properties are controversial (see Landau 1999 for a critical overview). However, much of the controversy appears to be the result of terminological differences. As we have seen in section 2.1, the classification as obligatory vs. non-obligatory control is not always straightforward. Given the various forms of control which all come with their own properties and restrictions, much depends on the classification one uses.

(Manzini 1983, Bouchard 1984, 1995, Koster 1984, Hornstein 1999) or logophoric (Grinder 1970, Kuno 1975, Lebeaux 1984, Landau 1999) nature of the embedded subject.

While syntactic approaches to control are intended to derive the properties of obligatory vs. non-obligatory control constructions, they are generally not aimed at explaining or predicting which predicates can or have to involve which form of control (though see Landau 1999 for an exception). Going back to the contrasts noted in the previous section, the question that arises for the determination of obligatory vs. non-obligatory control is how it is ensured that variable and partial control are excluded with matrix verbs like *order*, *permit*, *recommend*, *try* etc., but allowed with verbs like *offer*, *propose*, *ask*, or *decide*. A different syntax for these constructions would presumably derive the different control properties, however, the question of how we can guarantee that these constructions involve different structures nevertheless remains. In other words, it is not obvious how the syntax knows what type of subject or construction can or has to be chosen (e.g., anaphoric vs. pronominal subject, PRO/*pro* vs. trace etc.), or what kind of control mechanism applies.

The general solution to questions of this sort is to invoke additional lexical or selectional specifications. To account for the differences in the control behavior of the constructions mentioned above, it seems necessary for any approach to supplement the syntax of control with certain lexical or semantic specifications about the possible control relations. Note that shifting the burden to some unsystematic pragmatic accident (i.e., an account that assumes that there is no difference in the lexical properties and the syntax of these constructions) would miss the generalization that these two classes of control in fact correlate with a number of syntactic and semantic properties (as we will show below). Thus, taking verbs like *order*, *permit*, or *recommend*, for instance, the lexical meaning of these predicates has to include the information that the object of these verbs is the sole controller of the embedded subject. On the other hand, there is no pre-determined control relation in constructions with verbs like *offer*, *propose*, *ask*, or *decide*.

This lexical or semantic aspect of the determination of the control relation is the core feature of many semantic approaches to control. Chierchia (1983, 1984a, 1984b) for instance, denies the relevance of syntactic control and suggests instead that (obligatory) control infinitives are properties rather than propositions—i.e., they do not involve a subject. The control relations, according to Chierchia’s approach, are entailment relations that are made explicit as part of the meaning of the selecting predicate. More specifically, the subject is “added” later on—i.e., in context—by the application of meaning postulates such as the one in (7) (where  $\Box_j$  is a context dependent modal operator; (7)b is a rough paraphrase of (7)a).

- (7) a.  $try'(P)(x) \rightarrow \Box_j P(x)$  Chierchia (1984a: 34)  
 b. whenever x tries to bring about P, then in all the contextually relevant situations (namely those where what x tries actually succeeds) x does P

Thus, in case of *try*, the obligatory control effect arises as a result of the entailment relation built into the meaning of the higher verb.

In the following sections, we will concentrate on German infinitival constructions which will provide support both for and against a direct translation of a Chierchia style account into syntactic terms. In particular, we will show that a certain class of infinitival constructions, which crucially only involves obligatory control infinitives, displays syntactic properties that strongly point to the lack a syntactic subject. Although these properties indicate that there is a correlation between subjectless infinitives and obligatory control, we will also see that the correlation is only a one-way correlation, since obligatory control does not entail a subjectless infinitive (in syntac-

tic terms). The conclusion will be that the properties of German infinitives provide evidence for the necessity of two distinctions—a semantic distinction between obligatory and non-obligatory control, and a syntactic distinction between subjectless infinitives vs. infinitives with an embedded subject. Although these distinctions show an overlap they cannot be reduced to each other.

The proposal that we would like to put forward here is that the crucial distinction between obligatory and non-obligatory control is whether the antecedent is determined lexically/semantically or syntactically. In particular, we will assume that non-obligatory control predicates do not include ‘instructions’ for the interpretation of the embedded subject. An infinitival subject is projected as part of the syntactic structure and the antecedent is determined purely syntactically (by whatever one considers the correct control mechanisms). The meaning of the infinitival construction is then determined strictly compositionally from the output of the syntactic structure. Thus, non-obligatory control constructions are clauses syntactically and propositions semantically.

Obligatory control, on the other hand, is determined lexically/semantically. In line with semantic approaches to control, we assume that the obligatory control effect is the result of an inherent lexical property—e.g., an entailment relation built into the meaning of the selecting predicate (which identifies the infinitival subject with a pre-specified antecedent). Looking at the syntactic and semantic properties of obligatory control infinitives, however, we will see that in the case of obligatory control infinitives, the syntax/semantics mapping is not perfect. While obligatory control infinitives can be represented as subjectless predicates (at least in German), the lack of an infinitival subject (in syntax) is not obligatory. That is, we will provide evidence for the presence of a syntactic subject in obligatory control constructions.

There seem to be two basic ways to accommodate this mismatch. It could be assumed that obligatory control infinitives (but not non-obligatory control infinitives) that include a syntactic subject are translated into semantic properties. This line is taken for instance by Chierchia (1989) who suggests that PRO functions essentially as a property abstractor—i.e., a lambda-abstractor that turns the infinitive into a property. Note that it is crucial to restrict property abstraction to obligatory control infinitives. As has been argued extensively by Landau (1999), the lack of coreference between the understood infinitival subject and its antecedent in partial control contexts necessitates the presence of a separate infinitival subject (in syntax and semantics)—i.e., property abstraction would make it impossible to assign a partial control interpretation.

The second way to accommodate the syntax/semantics mismatch found in obligatory control constructions is to assume that obligatory control infinitives that include a syntactic subject are indeed translated into semantic propositions, but that these propositions are nevertheless subject to the effects of obligatory control. Thus, in this approach, obligatory control is a lexical property of certain predicates, however, this lexical specification is not tied to the assumption that obligatory control infinitives are semantic properties. We will pursue this option here and assume that obligatory control predicates are defined as functions that can either apply to properties or propositions. Crucially, however, obligatory control is built into the meaning of both definitions.<sup>6</sup> Assuming that obligatory control is determined lexically/semantically, a syntactic subject and the application of (syntactic) control mechanisms is in a sense vacuous in obligatory control constructions, since the antecedent of the infinitival subject is already pre-specified as

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6. Presumably, obligatory control meaning postulates can then not simply be seen as entailment relations as characterized above but rather as identity relations between the understood infinitival subject and a pre-specified antecedent.

part of the meaning of an obligatory control predicate. We claim that it is exactly this redundancy that licenses (but does not necessitate) the omission of a syntactic subject in obligatory control constructions.

The lexical determination of obligatory control and the (partial) separation of the syntactic and semantic properties has two important effects. First, a structure involving an obligatory control predicate and an infinitival subject is possible; second, such a configuration will nevertheless prohibit non-obligatory control relations, since obligatory control (which is an inherent lexical/semantic requirement of these predicates) has to be met to yield a well-formed interpretation.

In the following sections, we will provide support for this analysis. We will first show that properties targeting the syntactic structure (movement and binding) support a syntactic distinction between subjectless infinitives and infinitives with a subject, which correlates in the way presented above with the semantic properties of the infinitival constructions. Secondly, we will discuss a property targeting the semantic structure (the interpretation of elided infinitives) and show that this property supports the semantic distinction between obligatory vs. non-obligatory control as suggested here.

### 3.2 Restructuring

The first piece of evidence for the lack of a syntactic (PRO) subject comes from infinitival constructions that display *clause union* (cf. Aissen & Perlmutter 1976, 1983) or *restructuring* (cf. Rizzi 1978, 1982) effects. The property of restructuring constructions we will focus on here is a movement operation often labeled *long passive*. As is illustrated in (8), passivized (cf. (8)a) and unaccusative (cf. (8)b)<sup>7</sup> restructuring verbs affect the argument structure of the embedded predicate in the following way: the embedded object is assigned nominative case and agrees with the matrix auxiliary. Note that the infinitive does *not* show passive morphology.

- (8) a. *Der Lastwagen und der Traktor wurden/\*wurde zu reparieren versucht*  
 [the truck and the tractor]-NOM were/\*was to repair tried  
 ‘They tried to repair the truck and the tractor’
- b. *Der Brief und der Bericht sind/\*ist mir auf Anhieb*  
 [the letter and the report]-NOM are/\*is me-DAT straightaway  
 zu entziffern gelungen  
 to decipher managed  
 ‘I managed straightaway to decipher the letter and the report’

What is crucial about object movement of this sort is that in restructuring infinitives, the case properties in the embedded predicate are affected by passivization of the matrix verb; i.e., the suppression of structural case in the matrix clause (as a result of passive) causes the loss of accusative for the embedded object. Note also that object movement of this sort is restricted to restructuring infinitives. As the ungrammaticality of (9) shows, long passive is impossible in infinitival constructions involving a non-restructuring verb such as *plan, decide, announce*.<sup>8</sup>

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7. The verb *manage* is an unaccusative verb in German which requires the auxiliary *be* in the perfective.

8. We will consider the possibility of “long” object movement as a major criterion to distinguish between restructuring and non-restructuring. A discussion of other restructuring criteria and a finer grained classification of infinitival constructions has to be put aside here. The determination of restructuring is subject to some debate which is largely due to the fact that there are different grades of (non-)restructuring; furthermore, the labels “restructuring” vs. “non-restructuring” are not used uniformly when referring to these groups. Since dif-

- (9) a. \**dass der Traktor zu reparieren geplant wurde*  
 that the tractor-NOM to repair planned was  
 ‘that they planned to repair the tractor’  
 b. \**dass die Traktoren zu reparieren geplant wurden*  
 that the tractors to repair planned were  
 ‘that they planned to repair the tractors’

The only way to express passive with a non-restructuring verb is an impersonal passive construction as in (10)—i.e., a construction without long object movement.<sup>9</sup>

- (10) a. *dass [den Traktor zu reparieren ] geplant wurde*  
 that [the tractor-ACC to repair ] planned was  
 ‘that they planned to repair the tractor’  
 b. *dass [die Traktoren zu reparieren ] geplant wurde/\*wurden*  
 that [the tractors to repair ] planned was/\*were  
 ‘that they planned to repair the tractors’

“Long” object movement of this sort raises a number of questions for approaches that consider restructuring infinitives as full clauses—i.e., as structures that involve an independent embedded argument structure and in particular an embedded subject. The most urgent questions are why the embedded object loses accusative case when the matrix verb is passivized, why the embedded subject does not block this A-movement operation, and why object movement is impossible in non-restructuring infinitives.

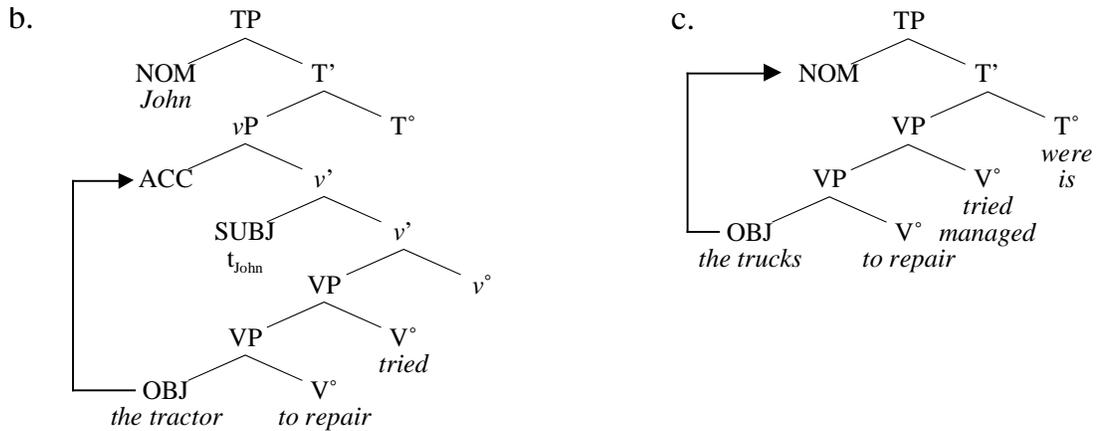
The analysis that we will pursue is built on the idea that restructuring infinitives do not involve clausal projections but are simple VPs, as has been suggested by a number of works on restructuring.<sup>10</sup> Taking VP-approaches a step further, we claim that a restructuring infinitive does not only lack C and T projections, but also does not include an embedded structural case position or assigner and an embedded subject. Let us first consider a sentence with an active restructuring verb such as the one in (11)a. Under the assumption that restructuring infinitives lack an embedded structural case position/assigner, the obvious question arising is how the embedded object is assigned accusative case. Our analysis is illustrated in (11)b. The only structural object case position in a sentence with an active restructuring verb is provided by the matrix *v*P. We thus assume that it is indeed the matrix case position that is responsible for the structural case of the embedded object. Assuming a movement approach to case checking (see also Wurmbrand 2000), the embedded object raises (overtly or covertly) to the “matrix clause” in order to check its accusative case.

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ferent “restructuring” criteria target different syntactic and semantic properties, the criteria often pick out different classes of infinitival constructions, and classifications that do not distinguish between these grades of (non-)restructuring will therefore give conflicting results. The reader is referred to Wurmbrand (in prep.) for an extensive discussion of the restructuring criteria and a systematization of the different grades of (non-)restructuring.

9. The examples in (10) require an intonational break before and after the infinitival complement. In general, German speakers prefer extraposition of non-restructuring infinitives, however, the intraposed position of the infinitive as in (10) is also grammatical.
10. Proponents of VP-approaches include Strozer (1976, 1981), Zagana (1982), Picallo (1985, 1990), Haider (1986a, 1986b, 1986c, 1991a, 1991b, 1993), DiSciullo & Williams (1987), Rochette (1988, 1990, 1999), Rosen (1989, 1990), Moore (1990, 1994), Cinque (1997a, 1997b), Wurmbrand (1998a, 1998b, 1998c, 1999, 2000, in prep.).

- (11) a. *weil Hans den Traktor zu reparieren versuchte*  
 since John the tractor-ACC to repair tried  
 ‘since John tried to repair the tractor’



Returning now to the passive and unaccusative examples in (8), the case and agreement facts are no longer surprising. Since restructuring infinitives do not include a structural object case position or assigner, the embedded object is dependent on a case position/assigner in the matrix predicate. If the matrix predicate is passivized or unaccusative, structural accusative is unavailable, leaving the (matrix) T as the only case assigner for the embedded object (cf. (11)c).<sup>11</sup> The analysis thus correctly predicts that in restructuring infinitives involving a passivized restructuring verb, the object enters into a case and agreement relation with the matrix T.

Non-restructuring constructions such as (10), on the other hand, project an embedded subject and have their own functional structure (vP, TP, or CP-infinitives depending on the “grade” of non-restructuring; cf. fn. 8). Assuming standard locality conditions, the embedded object enters into a case/agreement relation with the closest functional head—i.e., the embedded  $v^\circ$  rather than a head in the matrix clause—resulting in accusative rather than nominative case on the object and the lack of agreement with the matrix auxiliary. Furthermore, A-movement of the embedded object across the embedded subject is blocked.

Before turning to the consequences of long object movement for control, we will conclude the discussion of restructuring with another argument for the analysis as proposed here. So far, we have seen that the embedded object in a restructuring infinitive is not assigned case by an embedded structural case assigner but enters into a case and agreement relation with a head in the matrix predicate. What we will show now is that this case and agreement relation is not only possible but in fact obligatory. To do so, consider first the examples in (12) which at first sight appear to challenge the analysis presented here. Given the claim that restructuring infinitives do not include a structural object case/agreement position, we would expect that accusative should never be available for the embedded object in passive or unaccusative contexts. However, as is shown in (12), accusative objects are perfectly grammatical in infinitival complements combining with passivized or unaccusative restructuring verbs.

11. For reasons of simplicity we present passive and unaccusative constructions here as lacking a vP altogether. However, we do not commit ourselves to this structure. The only important fact for the analysis here is that there is no structural case position/assigner in passive constructions (i.e., no Spec,vP). Whether a passive construction involves or does not involve a passive  $v^\circ$  is orthogonal to the discussion of restructuring.

- (12) a. *dass versucht wurde/\*wurden den Traktor und den Lastwagen zu reparieren*  
 that tried was/\*were [the tractor and the truck]-ACC to repair  
 ‘that they tried to repair the tractor and the truck’
- b. *dasses ihm gelungen ist/\*sind den Traktor und den Lastwagen zu reparieren*  
 that it him managed is/\*are [the tractor and the truck]-ACC to repair  
 ‘that he managed to repair the tractor and the truck’

Assuming our analysis is correct, the obvious answer to the question of why accusative is possible and agreement with the matrix T is not necessary in the examples in (12) is that these examples are indeed instances of non-restructuring infinitives (i.e., infinitives that include an embedded subject and project a structural object case/agreement position). In other words, verbs like *try*, *manage* have to be considered as ambiguous—they either are restructuring verbs that combine with a bare VP-complement, or they are non-restructuring verbs that combine with a vP (or bigger) complement. To determine whether this claim is correct we have to find some test that shows that the infinitives under consideration do not display transparency properties. One such property is scrambling. Although the situation is slightly more complex for scrambling than for long passive most authors agree that only restructuring infinitives allow (non-focus) scrambling of a phrase from the infinitive. As is illustrated in (13)a, the embedded object can be scrambled from an extraposed restructuring infinitive; if, on the other hand, the matrix verb is a non-restructuring infinitive as in (13)b, scrambling is impossible (cf. (13)c).

- (13) a. *dass Hans den Traktor versucht hat zu reparieren*  
 that John the tractor-ACC tried has to repair  
 ‘that John (has) tried to repair the tractor’
- b. *dass Hans bedauert hat den Traktor reparieren zu müssen*  
 that John regretted has the tractor-ACC repair to must  
 ‘that John (has) regretted having to repair the tractor’
- c. \**dass Hans den Traktor bedauert hat reparieren zu müssen*  
 that John the tractor-ACC regretted has repair to must  
 ‘that John (has) regretted having to repair the tractor’

Returning to the examples in (12), the impossibility of scrambling can be straightforwardly illustrated. In contrast to (13)a, the examples in (14) which correspond to the examples in (12) (i.e., examples lacking a case and agreement relation between the embedded object and the matrix T) clearly block scrambling of the embedded object from the extraposed infinitive. These examples thus provide strong support for the claim that whenever an infinitive involves a structural accusative argument which cannot have been case-marked by the matrix verb, the infinitive is a non-restructuring infinitive.

- (14) a. \**dass den Traktor versucht wurde zu reparieren*  
 that [the tractor]-ACC tried was to repair  
 ‘that they tried to repair the tractor’
- b. \**dass (es) ihm den Traktor gelungen ist zu reparieren*  
 that (it) him [the tractor]-ACC managed is to repair  
 ‘that he managed to repair the tractor and the truck’

To sum up, although CP-approaches have various ways of building in assumptions that will derive long object movement, the major advantage of a VP-approach is that it not only straightfor-

wardly accounts for long object movement but also that it predicts and explains the existence of this movement operation.

Assuming our analysis is correct and restructuring infinitives lack an embedded subject, the question that arises is how the control effect can be accounted for, or, in other words, how an interpretation can be assigned to the understood embedded subject of a restructuring infinitive. Before we will answer this question, let us first look at the predicates that allow long object movement in German summarized in Table 1.

Table 1. Long A-movement

VERB		VERB		A-movement
<i>beginnen</i>	begin	<i>beabsichtigen</i>	intend (want)	+
<i>vergessen</i>	forget	<i>versuchen</i>	try	+
<i>wagen</i>	dare	<i>versäumen</i>	miss, neglect	+
<i>gelingen</i> [unacc]	manage	<i>mißlingen</i> [unacc]	fail	+
<i>empfehlen</i>	recommend	<i>erlauben</i>	allow	+
<i>verbieten</i>	forbid			+
<i>gestatten</i>	permit	<i>untersagen</i>	prohibit	%

Looking at the constructions that allow long A-movement in German, what is striking is that all predicates in Table 1 trigger obligatory control—i.e., variable, partial, or split control are prohibited in constructions involving these predicates. Under the analysis proposed above, this correlation comes as no surprise.<sup>12</sup> We have suggested that the omission of an infinitival subject in syntax (which is a necessary condition for long-object movement) is only possible when the interpretation of the subject is specified elsewhere—i.e., as part of the meaning of the higher predicate. Since the meaning of non-obligatory control predicates does not include a pre-specified antecedent for the embedded subject, a (non-obligatory control) structure lacking a syntactic subject would not be interpretable since the meaning of the embedded subject could not be determined (i.e., neither lexically nor syntactically). We thus expect that restructuring (i.e., long-object movement) is only possible with obligatory control predicates.

Going back to Chierchia’s approach, recall that (obligatory control) infinitives are properties (i.e., subjectless predicates) semantically which become associated with a subject post-semantically (via lexical entailments built into the meaning of the selecting verbs). Assuming a one-to-one syntax/semantics correspondence (but see section 3.4), the properties of German restructuring then provide additional evidence for Chierchia’s view: long object movement indicates that these infinitives lack a syntactic subject, and the obligatory (i.e., exhaustive) control relation of these constructions indicates that these constructions are properties semantically.

### 3.3 Binding

The second and crucial piece of evidence we will provide for the lack of an infinitival subject in restructuring infinitives and the presence of a subject in non-restructuring infinitives

12. Note that the correlation is only a one way correlation—i.e., obligatory control does not entail restructuring (however, restructuring entails obligatory control). As we discuss in detail in Wurmbrand (in prep.), restructuring is subject to a number of syntactic and semantic conditions that all have to be satisfied. Thus, while obligatory control is a necessary condition for restructuring it is not a sufficient one.

comes from the binding properties of infinitival constructions in German. Let us start with an example such as (15)a which involves an anaphor embedded in the infinitival complement and see how the binding relation is established. Under a clausal account to restructuring (i.e., an account which assumes that restructuring infinitives involve an embedded infinitival PRO subject), the anaphor is bound by the embedded subject as illustrated in (15)b. Under our analysis, on the other hand, there is no embedded subject in restructuring infinitives and the embedded anaphor is bound directly by the matrix subject (cf. (15)c).

- (15) a. *weil der Hans sich zu rasieren versuchte*  
 since the John SELF to shave tried  
 ‘since John tried to shave himself’
- b. since John [PRO<sub>i</sub> SELF<sub>i</sub> to shave] tried [+PRO]-*approach*
- c. since John<sub>i</sub> [SELF<sub>i</sub> to shave] tried [-PRO]-*approach*

Thus, both the [+PRO] approach in (15)b and the [-PRO] approach in (15)c provide a way of accounting for the coreference relation between the embedded anaphor and the matrix subject in examples such as (15)a. The major difference between the two approaches is whether the anaphor is bound by the matrix subject directly or whether the anaphor is bound by PRO—the relation of coreference with the matrix subject thus being established only indirectly. While (empirically) indistinguishable in examples such as (15)a, the two approaches make different predictions in environments where the matrix subject is for some reason absent or unavailable. Under the [+PRO]-approach, the presence or absence of a matrix subject should not affect the binding properties in the embedded infinitive, since the PRO subject would still be available as an antecedent (unless additional assumptions are made). Under the [-PRO]-approach, on the other hand, the elimination of the matrix subject would eliminate the only available binder for the anaphor in the infinitive, and the structure should thus become ungrammatical. As we will see, the binding facts in German will support the analysis suggested here, since anaphors are indeed illicit in restructuring infinitives (in contrast to non-restructuring infinitives) when there is no appropriate antecedent in the matrix predicate. We will first discuss contexts in which the infinitive is the only internal argument of the matrix predicate. Ditransitive constructions—i.e., contexts in which the selecting verb combines with an infinitive and a dative argument will be discussed in section 3.3.2.<sup>13</sup>

### 3.3.1 Transitive constructions

The first fact to be noted is that in German, anaphors are not generally impossible in infinitival complements combining with an impersonal matrix predicate (i.e., a predicate lacking an overt controller). As can be seen in (16), embedded anaphors can occur in impersonal passive constructions (cf. (16)a) and impersonal adjectival constructions (cf. (16)b). Furthermore, embedded anaphors are possible in the impersonal non-restructuring versions of constructions involving a potential restructuring verb (cf. (16)c; recall that infinitives involving a structural accusative object in passive or unaccusative matrix contexts are non-restructuring infinitives).

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13. Ditransitive constructions in which the verb combines with an infinitive and an accusative argument will be ignored since these constructions are generally non-restructuring infinitives (cf. Sabel 1996).

- (16) a. *Es wurde beschlossen* [PRO<sub>i</sub> *sich<sub>i</sub>* *den Fisch mit Streifen vorzustellen*]  
 It was decided [PRO<sub>i</sub> SELF<sub>i</sub> the fish with stripes-ACC to-imagine]  
 ‘They decided to imagine what the fish would look like with stripes’
- b. *Es war notwendig* [PRO<sub>i</sub> *sich<sub>i</sub>* *einen Wagen zu kaufen*]  
 It was necessary [PRO<sub>i</sub> SELF<sub>i</sub> a car-ACC to buy]  
 ‘It was necessary to buy oneself a car’
- c. *Es wurde versucht* [PRO<sub>i</sub> *sich<sub>i</sub>* *den Fisch mit Streifen vorzustellen*]  
 It was tried [PRO<sub>i</sub> SELF<sub>i</sub> the fish with stripes-ACC to-imagine]  
 ‘People tried to imagine what the fish would look like with stripes’

As indicated in the examples, we assume that the anaphors in (16) are bound by an embedded PRO subject. Note that it cannot be assumed that the anaphors are bound directly by an implicit argument in the matrix clause in (16). As is shown in (17)b, implicit passive arguments cannot bind anaphors in German.<sup>14</sup>

- (17) a. *Frederik<sub>i</sub> hat sich<sub>i</sub> ein Haus gekauft*  
 Frederic<sub>i</sub> has SELF<sub>i</sub> a house bought  
 ‘Frederic bought himself a house’
- b. *Ein Haus wurde (\*sich) gekauft*  
 A house was (\*SELF) bought  
 ‘A house was bought (\*oneself)’

The examples in (16) and in particular the contrast between these examples and the ungrammatical (17)b thus provides evidence for the existence of an embedded subject in non-restructuring infinitives (a further argument for this claim will be provided in the next section). Since the examples in (16) are non-restructuring infinitives (as witnessed by the embedded accusative objects), we correctly predict that infinitival subjects are projected in these examples, and binding of the anaphors is thus straightforward.

Turning to restructuring infinitives, it is easy to see that the situation changes drastically. In a clear restructuring configuration (e.g., a construction involving “long” passive) which does not involve a potential matrix antecedent, inherently reflexive predicates such as *sich vorstellen* ‘to imagine/recall the picture of’ cannot occur in the infinitival complement (cf. (18)a). Furthermore, as is shown in (18)b, benefactive anaphors associated with the implicit subject are impossible (however, the sentence is grammatical without the anaphors).

- (18) a. *\*weil {sich} der Fisch {sich} vorzustellen versucht wurde*  
 since {SELF} the fish-NOM {SELF} to-imagine tried was  
 ‘since somebody tried to recall the image of the fish’
- b. *weil {\*sich} der Turm {\*sich} zu bauen versucht wurde*  
 since {\*SELF} the tower-NOM {\*SELF} to build tried was  
 ‘since somebody tried to build (\*himself) the tower’

Assuming that restructuring infinitives lack an embedded (syntactic) subject and implicit arguments cannot bind anaphors in German, the contrasts in (16) and (18) can straightforwardly be

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14. There are some well-known counter examples to this claim. In particular, anaphors bound by an implicit argument seem to improve in generic contexts (at least for some speakers). Since all the examples we use are non-generic, the judgements are consistent and this interfering factor does not affect the argument made in the text.

accounted for. Since restructuring infinitives do not involve an embedded subject there is no possible antecedent for anaphors or reflexive predicates, and unbound anaphors are thus ruled out by the conditions of binding theory.

### 3.3.2 Ditransitive constructions

The final argument for the analysis proposed here comes from infinitival constructions combining with verbs that also select a dative argument. Let us start with an observation about dative arguments in German that will be of importance for the discussion to follow. As has been pointed out by Grewendorf (1984, 1988), anaphors cannot be bound by dative arguments in German as is illustrated in (19). Whatever the nature of this restriction is, it will allow us to draw certain conclusion about the presence or absence of infinitival subjects.

- (19) *weil der Hans<sub>h</sub> der Maria<sub>m</sub> sich<sub>h/\*m</sub> auf dem Photo zeigte*  
 since the John<sub>h</sub>-NOM to-the Mary<sub>m</sub>-DAT SELF<sub>h/\*m</sub> in the picture showed  
 ‘since John showed Mary himself/\*herself in the picture’

Consider first the example in (20)a with the (potential) restructuring verb *manage*. Since the infinitive involves an accusative object which cannot have been case-marked by the matrix predicate (recall that *manage* is an unaccusative predicate in German), this construction can only be a non-restructuring infinitive. As expected under our account, an anaphor can occur in this context, since non-restructuring infinitives project an embedded syntactic subject which can function as the antecedent for the embedded anaphor. Similarly, the ditransitive constructions in (20)b,c involving potential restructuring verbs allow embedded anaphors which we assume are bound by the embedded PRO subject.<sup>15</sup>

- (20) a. *Es ist ihm gelungen [PRO<sub>i</sub> sich<sub>i</sub> einen Turm zu bauen]*  
 It is him managed [PRO<sub>i</sub> SELF<sub>i</sub> [a tower]-ACC to build]  
 ‘He (has) managed to build himself a tower’  
 b. *Sie hat dem Hans erlaubt [PRO<sub>i</sub> sich<sub>i</sub> den Fisch mit Streifen vorzustellen]*  
 She has John-DAT allowed [PRO<sub>i</sub> SELF<sub>i</sub> the fish with stripes to-imagine]  
 ‘She allowed John to imagine what the fish would look like with stripes’  
 c. *Sie hat dem Hans verboten [PRO<sub>i</sub> sich<sub>i</sub> den Turm anzuschauen]*  
 She has John-DAT forbidden [PRO<sub>i</sub> SELF<sub>i</sub> the tower-ACC to look at]  
 ‘She forbade John to look at/investigate (refl.) the tower’

Importantly, the grammaticality of the examples in (20) (i.e., examples involving a dative “controller” for the embedded subject) provides a further argument for the presence of an embedded

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15. Note that the presence of accusative case in (20)b,c (vs. (20)a) does not a priori entail that these infinitives are non-restructuring infinitives, since the matrix predicates are potential structural case assigners and hence accusative could be assigned by the matrix predicate. However, in addition to the binding properties which we will discuss in the text, there is independent support for our claim that these examples are indeed non-restructuring infinitives. Although we cannot reproduce our analysis and the arguments for it here, we want to point out that in Wurmbrand (2000), we provide a way to distinguish whether case is assigned by the matrix predicate or the embedded predicate. In short, we show that in restructuring constructions, case checking has to be met by movement, and that movement for case reasons does not allow reconstruction in German. Since the embedded objects in (20)b,c occur inside the infinitives and take scope under the matrix predicates, it can be concluded (given the analysis in Wurmbrand 2000) that structural case is not assigned in the matrix predicate.

subject in non-restructuring contexts. If one were to assume that obligatory control infinitives are necessarily subjectless predicates—i.e., if examples such as the ones in (20) would lack an embedded syntactic subject, it would not be clear how the anaphors are bound in these examples. Since, under this view, the dative arguments would be the only potential binders for the embedded anaphors, however, dative arguments cannot bind anaphors in German (cf. (19)), the embedded anaphors would end up without an antecedent, and hence the sentences should be ungrammatical. We thus conclude that the presence vs. absence of a syntactic subject is tied to the restructuring/non-restructuring distinction rather than the obligatory/non-obligatory control distinction.

Turning finally to (true) restructuring constructions, we find again a clear contrast between restructuring and non-restructuring infinitives concerning the possibility of embedded anaphors. If examples such as the ones in (20) are changed to (clear) instances of restructuring infinitives, anaphors become impossible. This is illustrated in (21) by the impossibility of reflexive predicates in infinitives involving “long” passive (i.e., restructuring infinitives). Note in particular (21)c which shows that long passive (and hence restructuring) is possible, however, only when the embedded predicate is not reflexive.<sup>16</sup>

- (21) a. *\*weil der Fisch dem Hans<sub>i</sub> sich<sub>i</sub> mit Streifen vorzustellen gelungen ist*  
 since the fish-NOM the John<sub>i</sub> SELF<sub>i</sub> with stripes imagine managed is  
 ‘since John managed to imagine what the fish would look like with stripes’
- b. *\*weil der Fisch dem Hans<sub>i</sub> sich<sub>i</sub> mit Streifen vorzustellen erlaubt wurde*  
 since the fish-NOM the-John<sub>i</sub> SELF<sub>i</sub> with stripes imagine allowed was  
 ‘since somebody allowed John to imagine what the fish would look like with stripes’
- c. *weil ein Turm dem Hans<sub>i</sub> (\*sich<sub>i</sub>) anzuschauen verboten wurde*  
 since a tower-NOM the-John<sub>i</sub>-DAT (\*SELF<sub>i</sub>) to look at forbidden was  
 ‘since John was not allowed to look at/investigate (\*refl.) a (certain) tower’

To conclude this section, the distribution of anaphors in German shows the following contrast: non-restructuring infinitives (i.e., infinitives characterized by the presence of a structural case position/assigner in the infinitive) allow embedded anaphors whereas restructuring infinitives prohibit embedded anaphors when the matrix predicate does not include an appropriate binder for the anaphor. We have argued that this contrast follows from the presence vs. absence of infinitival subjects—a property that is independently motivated by the interpretation of these constructions (but see next section)—and that neither an account that assumes that infinitives generally involve a syntactic subject, nor an account that assumes that infinitives generally lack a syntactic subject seems to be able to account for this contrast without further assumptions.

### 3.4 Syntax ≠ semantics

In the previous sections, we have argued for the following correlations between the syntactic and semantic properties of infinitival constructions: infinitives that lack a syntactic subject

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16. Some speakers might find long passive as in (21)c slightly marked. As mentioned in fn. 15, case movement in restructuring constructions does not allow reconstruction; the only way constructions with “long” passive can be interpreted is with the object taking scope over the matrix predicate. This resulting interpretation is often pragmatically marked (as in (21)c with the object taking scope over *forbid*). The markedness of (certain) long passive constructions is thus expected and does not affect the analysis here or our account of restructuring.

(i.e., restructuring infinitives) are obligatory control infinitives (or, in Chierchia’s terms, semantic properties rather than propositions). We have also assumed that non-obligatory control requires the presence of a syntactic subject. A closer look at the interaction of the syntax and semantics of infinitival constructions, however, shows that the correlation between the lack of a syntactic subject and obligatory control is only a one-way correlation and that the distribution of restructuring and the binding properties in infinitives also raise a serious question for a one-to-one mapping between syntax and semantics.

Recall that we have claimed that non-restructuring infinitives (including the non-restructuring versions of constructions with a potential restructuring verb) project an embedded syntactic (PRO) subject. The evidence for this claim came from the binding asymmetry between (16)c and (18)a (repeated here as (22)a,b): while embedded anaphors are licensed in non-restructuring infinitives such as (22)a, they are impossible in restructuring constructions lacking an antecedent in the matrix predicate (cf. (22)b). We have argued that this contrast is due to the presence ((22)a) vs. absence ((22)b) of a syntactic antecedent for the anaphor—an embedded syntactic PRO subject as indicated in the examples. Most importantly, however, both examples in (22) are obligatory control constructions. Similarly, the non-restructuring versions of examples involving a potential restructuring verbs (i.e., examples such as the ones in (12), repeated as (22)c) can only receive an obligatory control interpretation.

- (22) a. *Es wurde versucht* [PRO<sub>i</sub> *sich<sub>i</sub> den Fisch mit Streifen vorzustellen*]  
 It was tried [PRO<sub>i</sub> SELF<sub>i</sub> the fish with stripes-ACC to-imagine]  
 ‘People tried to imagine what the fish would look like with stripes’
- b. \**weil {sich} der Fisch {sich} vorzustellen versucht wurde*  
 since {SELF} the fish-NOM {SELF} to-imagine tried was  
 ‘since somebody tried to recall the image of the fish’
- c. *dass versucht wurde* [PRO *den Traktor und den Lastwagen zu reparieren*]  
 that tried was [PRO [the tractor and the truck]-ACC to repair]  
 ‘that they tried to repair the tractor and the truck’

Assuming our analysis is correct, the examples in (22) show that obligatory control infinitives can be represented as clausal complements (i.e., vPs, TPs, or CPs) in the syntax (or more specifically, at the level where binding applies).<sup>17</sup> Thus, the presence of a syntactic subject does not entail non-obligatory control (or obligatory control does not entail the lack of a syntactic subject). In other words, while the semantic control properties of an infinitival construction play an important role for the question of whether a PRO subject is projected or not, they are not sufficient to determine whether the infinitive can or cannot include a syntactic subject. The presence or absence of an infinitival subject is ultimately a syntactic issue which is reflected in the distinction between restructuring and non-restructuring infinitives.

Although these facts show that there is only a one way correlation between obligatory vs. non-obligatory control and the absence vs. presence of an infinitival subject (cf. also fn. 12), they nevertheless seem to support a lexical/semantic approach to obligatory control. Let us see how the obligatory control effect in (22)a,c is accounted for in our approach. Since these examples include a syntactic infinitival subject, the syntactic derivation could in principle yield a non-obligatory control interpretation. However, at the syntax/semantics interface, this interpretation

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17. By *clausal complement*, we refer to a structure that includes a subject (i.e., at least vP). Whether these infinitives involve other functional projections such as TP, CP, is left aside here.

will clash with the inherent semantic properties of the selecting (obligatory control) verbs, and hence the structures would yield contradictory interpretations. Thus, the semantic requirement of obligatory control (i.e., the entailment or identity relation which is built into the lexical meaning of these verbs), will guarantee the correct control properties even in cases where a syntactic subject is present.

### 3.5 “It” anaphors

In this last section of the paper, we will focus on the interpretation of non-overt infinitives that are represented by *it*-anaphors, and we will see again that the syntactic structure cannot be fully reduced to the interpretation of infinitives. Chierchia (1984a, 1984b) has noted that *it*-anaphors replacing an infinitive or a gerund in examples such as (23) display an ambiguity between a strict and a sloppy interpretation.<sup>18</sup> In (23), the antecedent of *it* can refer to a situation in which the understood subject of the non-expressed gerund is identical to the subject of the verb that combines with *it* (i.e., a sloppy interpretation with *Mimi* as the understood subject of the elided gerund), or to a situation in which the understood subject of the non-expressed gerund is the subject of the verb that combines with the associate or antecedent of *it* (i.e., a strict interpretation with *Ezio* as the understood subject of the elided gerund).

- (23) *Ezio likes fooling around, but I would bet that his wife Mimi doesn't like it at all*
- |    |                         |                       |
|----|-------------------------|-----------------------|
| a. | it: Mimi fooling around | <i>sloppy reading</i> |
| b. | it: Ezio fooling around | <i>strict reading</i> |

The situation is different when the matrix predicate is changed to a verb like *begin*. As can be seen in (24) (slightly modified from Chierchia), only a sloppy interpretation is available; a strict reading in which the understood subject of the elided gerund refers back to the subject of the antecedent of *it* is excluded.

- (24) *Ezio began playing the violin for fun and Nando began it out of lust*
- |    |                     |                         |
|----|---------------------|-------------------------|
| a. | it: Nando's playing | <i>sloppy reading</i>   |
| b. | it: *Ezio's playing | * <i>strict reading</i> |

The analysis Chierchia (1984a, 1984b) provides to account for the (im)possibility of the strict interpretation of *it*-anaphors is built on the assumption that infinitives and gerunds are semantic properties (i.e., subjectless predicates) that become associated with a subject contextually via the application of meaning postulates. Furthermore, Chierchia assumes that *it*-anaphors are interpreted essentially like pronouns, i.e., as variables that are either bound by a structural antecedent or receive their value from context. Let us first see how the two interpretations are accounted for in Chierchia's theory. For the sloppy interpretation in (23) (repeated in detail in (25)), Chierchia assumes that *it* represents a property in syntax/semantics which is bound by the property *fooling around* in the preceding conjunct (cf. (25)a). The entailment relation (meaning postulate) built into the meaning of the predicate *like* then identifies the subject of the embedded property with the subject of the selecting verb. Thus, in both conjuncts, the embedded property is associated

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18. In English, *it*-anaphors can only replace gerunds. As we will see below, this is not the case in German where *it* can stand for an infinitive. Note that we do not make any claims about the structure of gerunds in English; we only use examples with gerunds in this section to illustrate the strict vs. sloppy ambiguity and to lay out Chierchia's analysis.

with the subject of the verb it is the complement of—*Ezio* in the first gerund, *Mimi* in the second gerund (cf. (25)b).

(25) *Ezio likes fooling around .... Mimi doesn't like it at all*

- a. Ezio likes [ fooling around]<sub>k</sub>.... Mimi doesn't like it<sub>k</sub> at all *it-association*  
 Ezio likes [ fooling around]<sub>k</sub>.... Mimi<sub>m</sub> doesn't like [fooling around]<sub>k</sub>  
 b. Ezio<sub>e</sub> likes [SUBJ<sub>e</sub> fooling around]<sub>k</sub>.... Mimi<sub>m</sub> doesn't like [SUBJ<sub>m</sub> fooling around]<sub>k</sub>  
*meaning postulate*

For the strict reading in (23) (repeated in (26)), on the other hand, Chierchia assumes that *it* stands for a proposition in syntax/semantics. The antecedent for this proposition is determined contextually by associating *it* with the proposition *SUBJ fooling around* of the preceding conjunct. That is, as is illustrated in (26)a,b, the first conjunct is associated with a subject via the meaning postulate of *like*; the resulting proposition is then taken as the antecedent for the *it*-anaphor (cf. (26)c).

(26) *Ezio likes fooling around.... Mimi doesn't like it at all*

- a. Ezio likes [ fooling around]... Mimi doesn't like it<sub>PROPOSITION</sub>  
 b. Ezio<sub>e</sub> likes [SUBJ<sub>e</sub> fooling around]... Mimi doesn't like it<sub>PROPOSITION</sub> *meaning postulate*  
 c. Ezio<sub>e</sub> likes [SUBJ<sub>e</sub> fooling around]<sub>k</sub>... Mimi doesn't like it<sub>k</sub> *it-association*  
 Ezio<sub>e</sub> likes [SUBJ<sub>e</sub> fooling around]<sub>k</sub>... Mimi doesn't like [SUBJ<sub>e</sub> fooling around]<sub>k</sub>

Thus, the antecedent of *it* in (26) is not a structural entity (i.e., it is neither present in syntax nor in semantics) but rather an object that is created post-semantically. Since, according to Chierchia, the predicate *like* can in principle combine with a proposition, an alternative derivation—a structure in which *it* refers back to a structural proposition—might be possible for the strict interpretation in examples such as (26). However, as we will see below, the mechanism of associating *it* with a non-structural antecedent (i.e., a contextually created proposition) will still be required in Chierchia's system for examples in which the first predicate can only combine with a property.

To account for the impossibility of a strict interpretation of *it*-anaphors in *begin*-contexts, Chierchia (1984a, 1984b) assumes that certain predicates are incompatible with propositional complements. Chierchia points out that syntactically, verbs such as *like* can combine with a clausal complement or a subjectless VP-complement (cf. (27)a,b); verbs like *begin*, on the other hand, are only compatible with a VP-complement (cf. (27)c,d).<sup>19</sup> Assuming that there is a straightforward mapping between syntax and semantics, we can then expect that *like* is compatible with both a property and a proposition, whereas *begin* is only compatible with a property. In other words, if a *begin*-type predicate combines with an *it*-anaphor, *it* can only stand for a property and hence will always have to refer back to a property, yielding only a sloppy interpretation.

- (27) a. ... *like* [PROPERTY INF ] *John likes Mary's fooling around*  
 b. ... *like* [PROPOSITION INF ] *John likes fooling around*  
 c. ... *begin* [PROPERTY INF ] *John began fooling around*  
 d. \*... *begin* [PROPOSITION INF ] \**John began Mary's fooling around*

Before we discuss Chierchia's analysis, let us first give an overview of the situation in German, where *it*-anaphors can replace infinitives. The interpretation of *it*-anaphors in German shows two

19. (27)d is acceptable under the (irrelevant) interpretation where *begin* is interpreted as *cause*.

crucial generalizations. First, as is summarized in Table 2, the strict vs. sloppy interpretation of *it*-anaphors depends solely on type of predicate combining with *it*; the nature of the antecedent of *it* is irrelevant. Second, we will see that strict interpretations are only possible when the *it*-anaphor combines with a non-obligatory control predicate (according to our classification in section 2.1); the syntactic status of the infinitive (i.e., whether it is a subjectless restructuring complement or a non-restructuring complement with an infinitival subject) will turn out to be irrelevant.

Table 2. Strict/sloppy readings of “it”-anaphors

<i>Antecedent</i>	<i>“it”</i>	<i>strict</i>	<i>sloppy</i>	<i>Example</i>
Non-obligatory control	Non-obligatory control	+	+	(28)a
Obligatory control	Non-obligatory control	+	+	(28)b
Non-obligatory control	Obligatory control	-	+	(28)c
Obligatory control	Obligatory control	-	+	(28)d

Examples illustrating the four possibilities in Table 2 are given in (28). In (28)a,b, *it* combines with non-obligatory control predicates and a strict interpretation is possible (the first paraphrase of the examples in (28) represents the sloppy interpretation, the second paraphrase represents the strict interpretation). As an aside, the two interpretations in (28)a,b correlate with an interesting difference in intonation, which we have no explanation for at this point: under the sloppy interpretation, the main sentence stress falls on the subject (i.e., *Peter*); under the strict interpretation, the main sentence stress falls on the matrix verb (i.e., *angekündigt* ‘announce’). In (28)c,d, on the other hand, *it* combines with obligatory control predicates and a strict interpretation is impossible.

- (28) a. *Hans beschloß zu heiraten [nachdem Peter es angekündigt hatte]*  
 John decided to get-married [after Peter *it* announced had]  
 ‘John decided to get married after Peter had announced that he, Peter, would get married’  
 ‘John decided to get married after Peter had announced that John would get married’
- b. *Hans wagte zu heiraten [nachdem Peter es angekündigt hatte]*  
 John dared to get-married [after Peter *it* announced had]  
 ‘John dared to get married after Peter had announced that he, Peter, would get married’  
 ‘John dared to get married after Peter had announced that John would get married’
- c. *Hans beschloß zu heiraten [nachdem Peter es gewagt hatte]*  
 John decided to get-married [after Peter *it* dared had]  
 ‘John decided to get married after Peter had dared to get married’  
 \*‘John decided to get married after Peter had dared that John would get married’
- d. *Hans wagte zu heiraten [nachdem Peter es versucht hatte]*  
 John dared to get-married [after Peter *it* tried had]  
 ‘John dared to get married after Peter had tried to get married’  
 \*‘John dared to get married after Peter had tried that John would get married’

The same situation holds for ditransitive constructions. As can be seen in (29)a, non-obligatory control predicates such as *offer* allow a strict and a sloppy interpretation for the *it*-anaphor.<sup>20</sup> *It*-anaphors combining with an obligatory control predicate such as *order* (cf. (29)b), on the other hand, can only be interpreted with a sloppy interpretation (i.e., the understood subject of the elided infinitive is obligatorily coreferent with the object of the selecting verb). Finally, (29)c shows that partial control patterns with non-obligatory control—a partial control interpretation is possible for both the strict and the sloppy interpretation of the *it*-anaphor. Finally as noted in (29)c, obligatory control verbs such as *try* cannot combine with an *it*-anaphor that refers back to a collective predicate when the subject of the obligatory control verb is singular.<sup>21</sup> Since obligatory control predicates prohibit a partial control interpretation and only allow a sloppy interpretation in ellipses contexts, the understood subject of the infinitive replacing the *it*-anaphor in (29)c can only be *the principal*. This singular subject, however, is incompatible with the collective predicate (of the elided infinitive) and the example is thus correctly predicted to be ungrammatical.

- (29) a. *Peter hat sich geweigert* [für die Freunde seiner Mutter Holz zu hacken]  
 Peter has SELF refused [for the friends of-his mother wood to chop]  
*obwohl sie es ihnen schon angeboten hatte*  
 although she *it* them already offered had  
 ‘Peter refused to chop wood for the friends of his mother, although she had already offered them that he/she/they (Peter and his mother) would chop wood for them’
- b. *Peter hat angeboten* [für die Freunde seiner Mutter Holz zu hacken]  
 Peter has offered [for the friends of-his mother wood to chop]  
*nachdem sie es ihnen befohlen hatte*  
 after she *it* them ordered had  
 ‘Peter offered to chop wood for the friends of his mother, after she had ordered them to chop wood’  
 \*‘Peter offered to chop wood for the friends of his mother, after she had ordered them that he (Peter) should chop wood’
- c. *Peter hat versprochen* [*sich im Schloß zu versammeln*]  
 Peter has promised [SELF in-the castle to gather]  
*nachdem der Direktor es beschlossen/\*versucht hatte*  
 after the principal *it* decided/\*tried had  
 ‘Peter promised to gather in the castle after the principal had decided that Peter and his associates would gather in the castle’  
 ‘Peter promised to gather in the castle after the principal had decided that he [the principal] and his associates would gather in the castle’  
 \*‘Peter promised to gather in the castle after the principal had tried that he [the principal] (and his associates) would gather in the castle’

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20. The pragmatic context of the first sentence in this example favors subject control of the elided infinitive. However, if the context is modified accordingly, object control is equally available.

21. We thank Idan Landau for pointing us to this prediction.

The examples in (28) through (29) thus show that the distinction between non-obligatory and obligatory control as suggested here is directly reflected in the possibility vs. impossibility of a strict interpretation of infinitival complements expressed by *it*-anaphors. The final question we want to address again is whether this semantic distinction determining the interpretation of *it*-anaphors is also reflected in the syntactic structures, or in other words, whether obligatory control infinitives (i.e., infinitives characterized as properties semantically) necessarily correspond to subjectless VP-predicates in syntax. As in the case of binding and restructuring (see section 3.4), the answer will be negative, and *it*-anaphors will hence provide another piece of evidence against a one-to-one mapping of syntactic and semantic structure. The crucial fact that will allow us to make this point is that *it*-anaphors that combine with an obligatory control predicate but that at the same time give rise to the assumption that the *it*-anaphor represents a syntactic clause (i.e., vP, TP, or CP) clearly disallow a strict interpretation. Hence, the syntactic structure (whether the infinitive projects a subject or not) seems to be irrelevant in *it*-anaphor contexts—what is crucial is the semantic property of obligatory control.

To show that an *it*-anaphor represents a clausal structure syntactically is not straightforward and can only be shown indirectly. In examples such as (30)a, the *it*-anaphor combines with the obligatory control predicate *manage*. Note first that the only interpretation *it* can receive in this example is a sloppy interpretation (i.e., the subject of the elided infinitive is understood to be *Mary*); a strict interpretation in which the subject of the elided infinitive refers back to *Peter* is strictly impossible (cf. (30)b). Secondly and most importantly, this example provides (indirect) evidence for the claim that *it* represents a syntactic clause (i.e., vP, TP, or CP) rather than a subjectless VP. Consider the simplified structure in (30)c—i.e., a structure in which *it* has been associated with an antecedent. As we have seen in the previous section, dative arguments cannot bind anaphors in German. Assuming that the same binding conditions hold in (30)c (i.e., for the associate of *it*), the grammaticality of (30) then provides evidence for the presence of an infinitival subject as an antecedent for the embedded anaphor in (30)c. If the infinitive does not include a PRO subject at the level where binding applies (as in (30)d), the anaphor would end up without an antecedent and the structure would be predicted to be ungrammatical (like (22)b). We thus conclude that the correct structure for *it* in (30)a is the clausal structure in (30)c rather than the VP-structure in (30)d.<sup>22</sup>

- (30) a. *Peter hat beschlossen [sich den Fisch mit Streifen vorzustellen]*  
 Peter has decided [SELF [the fish with stripes]-ACC to-imagine]  
*nachdem es der Maria gelungen ist*  
 after it the Mary-DAT managed is  
 ‘Peter decided to imagine what the fish would look like with stripes after Mary managed to imagine what the fish would look like with stripes’

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22. Note that if one were to assume that binding takes place *after* the meaning postulate applies (i.e., (30)d is the syntactic structure for (30) and binding applies to the structure in (30)c which is created contextually), the idea that obligatory control infinitives are subjectless VPs (syntactically) could be maintained. However, this approach would then not be able to account for the ungrammaticality of examples such as (22)b, which would (incorrectly) be predicted to be grammatical. The same problem would arise for the other examples provided in section 3.3 as evidence against a syntactic PRO subject.

- b. Mary-DAT<sub>M</sub> managed [SUBJ<sub>M</sub> SELF<sub>M</sub> the fish-ACC to-imagine]  
 \*Mary-DAT<sub>M</sub> managed [SUBJ<sub>p</sub> SELF<sub>p</sub> the fish-ACC to-imagine]
- c. Mary-DAT<sub>M</sub> managed [SUBJ<sub>M</sub> SELF<sub>M</sub> the fish-ACC to-imagine]  
└──────────┘
- d. Mary-DAT<sub>M</sub> managed [ SELF<sub>M</sub> the fish-ACC to-imagine]  
└──────────┘ ✕

To summarize, an analysis that ties the possibility of a strict interpretation of an *it*-anaphor to the syntactic structure (in particular the presence of a syntactic subject) seems to make the wrong prediction for the interpretation of *it*-anaphors in German. Rather, the crucial property that licenses a strict interpretation is the semantic property of obligatory control. Going back to our analysis of obligatory control, we have proposed that obligatory control is compatible with a syntactic subject (as witnessed by the movement and binding properties). However, as a result of the inherent lexical/semantic property of obligatory control predicates, which identifies the embedded subject with a pre-specified argument of the obligatory control verb, only control relations that meet this semantic requirement will be interpretable. The same reasoning can be applied to the interpretation of *it*-anaphors. Since obligatory control predicates impose as part of their meanings a certain control relation on the embedded subject, this control relation has to be met in the embedded structure—i.e., the infinitive that replaces *it*. Thus, whether the *it*-anaphor stands for an infinitive that is a subjectless VP (i.e., a restructuring infinitive) or a clause (i.e., a non-restructuring infinitive) has no bearing on the control relation when the selecting predicate is an obligatory control predicate. Since the strict interpretation (like long distance control) is incompatible with the semantic requirement of obligatory control, obligatory control predicates combining with an *it*-anaphor will thus generally block a strict interpretation of their complements.

#### 4. Conclusion

Table 3 provides an overview of the properties found in infinitival constructions in German that we have discussed in this paper. *Restructuring* refers to infinitives without an embedded (PRO) subject; *non-restructuring* refers to infinitives with an embedded (PRO) subject.

Table 3. Syntactic and semantic properties of infinitival constructions

<i>Control relation</i>	<i>Syntactic structure</i>	<i>Strict reading</i>		<i>Long passive</i>	<i>Embedded anaphors (&amp; no matrix antecedent)</i>
Obligatory	Restructuring infinitive	+	-	+	-
Obligatory	Non-restructuring infinitive	+	-	-	+
Non-obligatory	Non-restructuring infinitive	+	+	-	+
Non-obligatory	Restructuring infinitive	-	N/A	N/A	N/A

The main claim we have made in this paper is that different properties target different aspects of the syntactic and semantic structure. Movement and binding (principle A) target the syntactic restructuring vs. non-restructuring distinction, whereas the interpretation of *it*-anaphors targets the semantic obligatory vs. non-obligatory control distinction. As can be seen in Table 3, long

object movement requires the lack of a syntactic subject and hence it is only possible in restructuring contexts. Embedded anaphors, on the other hand, require the presence of a syntactic subject (in the absence of an appropriate matrix antecedent) and hence they are only possible in non-restructuring contexts. Whether the infinitive is an obligatory or non-obligatory control infinitive has only an indirect bearing on these two syntactic properties. We have suggested that subjectless infinitives (i.e., restructuring infinitives) are only licensed when the control relation is recoverable from the meaning of the selecting predicate (i.e., in obligatory control contexts). The opposite situation holds for the interpretation of *it*-anaphors. A strict reading for *it*-anaphors requires a non-obligatory control context. Whether the infinitive is a restructuring or non-restructuring infinitive is irrelevant for this property.

## **Acknowledgements**

Earlier versions of this paper were presented at the University of Potsdam, at the *Österreichische Linguistentagung* in Vienna, and at the *15th Comparative Germanic Syntax Workshop* in Groningen. I would like to thank the audiences of these talks, as well as Idan Landau and Jonathan Bobaljik for many helpful comments and discussions. Partial funding for this research was provided by a grant from the Social Sciences and Humanities Research Council of Canada. All errors of fact and interpretation are my responsibility.

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