# CONTROL
## in Generative Grammar

### A Research Companion

IDAN LANDAU

CAMBRIDGE

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The subject of nonfinite clauses is often missing, and yet is understood to refer to some linguistic or contextual referent (e.g. *Bill preferred __ to remain silent* is understood as "Bill preferred that he himself would remain silent"). This dependency is the subject matter of *control theory*. Extensive linguistic research into control constructions over the past five decades has unearthed a wealth of empirical findings in dozens of languages. Their proper classification and analysis, however, have been a matter of continuing debate within and across different theoretical schools. This comprehensive book pulls together, for the first time, all the important advances on the topic. Among the issues discussed are: the distinction between raising and control, obligatory and nonobligatory control, syntactic interactions with case, finiteness and nominalization, lexical determination of the controller, and phenomena like partial and implicit control. The critical discussions in this work will stimulate students and scholars to further explorations in this fascinating field.

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# Contents

# Preface

Control is one of the earliest concerns of generative grammar. Key puzzles are already noted in Chomsky 1965, and one of the first dissertations in the field, Rosenbaum 1967 (originally 1965), is largely dedicated to the topic. Theories of control figure prominently in every major school of thought in generative grammar (GB-minimalism, Categorial Grammar, LFG, HPSG), and the topic has been addressed from every possible angle – conceptual structure, lexical semantics, syntax, formal semantics and pragmatics. Over the past four decades, a vast amount of data has been collected and described regarding the manifestation of control in many different languages. Lively debates on the nature of control keep invigorating the field.

And yet, during all this time, not a single survey work solely dedicated to control has appeared that attempts to organize and synthesize all this knowledge, and present it in a systematic fashion.[1] This lacuna troubled me when I first became engaged with control, sometime in the late 1990s, and it has continued to do so ever since. The present book aims to fill this lacuna.

A number of goals – scientific, methodological and educational – have guided my thinking when putting this book together.

Perhaps the most urgent of all was simply empirical: to put the facts of control – *all* of them – on the table, for the service of future research. The last decade has seen a dramatic surge in interest in control, with dozens of studies uncovering novel data in many languages, and newcomers often find it difficult to keep track of all these developments. On the other hand, again and again studies of control neglect to take into account important findings and generalizations that have already been established. Old facts are "rediscovered," or worse, simply ignored. This situation, to my mind, seriously hampers the progress of the field, for there cannot be any progress without recognition and assimilation of past achievements.

[1] Stiebels 2007 is the most comprehensive descriptive survey to date. It is, however, confined to complement control, leaving out adjunct and nonobligatory control. It is also very laconic on the semantic aspects and the theoretical implications of control.

Indeed, close attention to the past, or the history of the field, has been a related goal of the present work. A common bias of young researchers is to focus on "cutting edge" publications, to the occasional neglect of classical works. This bias is understandable to a certain extent. Theoretical tools and vocabularies in linguistics change ever so rapidly and it becomes increasingly difficult to recover the theoretical mindset of works from three or even two decades ago. At the same time, there can be little doubt that classical works – in linguistics as in any other field – hold much interest for the current scholar. Often one finds curious and challenging data in them, that have been filtered out in later works. Such data, typically, spur new discoveries and innovations. Furthermore, classical works often direct our attention to real scientific problems (as opposed to technical quibbles) precisely *because* they frame analytic problems in ways that are less theory-laden than current works do. And finally, let us not forget that the founding fathers of generative grammar were (and are) pretty smart folks; it always pays to read what they had to say about linguistic problems, control included.

In the same vein, I have tried to do some historical justice to studies of control that for one reason or another were not assimilated into the mainstream literature. In hindsight, quite a few of these works are certainly worth present attention, if only for raising problems that students of control ought to address. Turning the spotlights to such works has been one of my goals (illustrative examples include Postal 1970, Clements 1975, Roeper 1987, Clark 1990, Kayne 1991, Kawasaki 1993, Kroeger 1993).

On the other hand, this book by no means intends to relate the history of control, and indeed, its structure is patently theoretical, not chronological. First and foremost, it is intended to be used as a research companion, and as such, to stimulate further explorations into various aspects of control. This methodological goal underlies much of the discussion throughout the book: alongside descriptive passages, the reader will often encounter critical assessments of various proposals and analyses, pointing out their merits and faults. When theories make conflicting claims, the text does not leave the choice between them to the taste of the reader but tries to (dis)confirm one or the other; when empirical generalizations are reported that are known to be inaccurate or false, the text makes that clear. No less important, questions that cannot be answered due to limitations of current knowledge or understanding are highlighted as open research problems. At every point along the way, the reader is encouraged to take a critical stand on the issues under discussion.

Over four decades of research on control have produced not only heated disputes and disagreements, but also some solid results that seem unlikely to go away. This fact is, regrettably, not sufficiently recognized, owing to the frequent debates and to the lack of comprehensive accounts of control. For example, despite persistent skepticism, PRO exists, and there are compelling

arguments (alongside bad ones) to show it. These arguments were scattered in the literature so their joint force was not always appreciated; here they are assembled together, to settle the issue once and for all (see Chapter 3). Another example, there is a systematic correlation between finiteness ingredients and obligatory control, but it is clearly *not* the simplistic "textbook" view, whereby "only nonfinite clauses display obligatory control" (see Section 4.1). And a final example, nonobligatory control is *not* structurally constrained, despite common claims to the contrary (see Chapter 7). All these results should become a standard part of the lore of every practicing generative linguist, just like the knowledge that syntactic islands exist, that operator scope is computed by c-command, etc.

True to its intended *survey* function, the book's expository approach is ecumenical in principle. That is, there is no attempt to vindicate one theoretical framework over others on the basis of their treatments of control. Rather, I have sought to extract common insights and lay them out in fairly theory-neutral ways, so that scholars of different persuasions can all benefit from the discussion. Once technical jargon is weeded out, analyses that are officially "affiliated" to opposing frameworks often turn out to have more in common than analyses that share affiliation. Having said that, I should state the obvious: no presentation is absolutely impartial, certainly not in a highly divided field like generative grammar. My own training and "grammatical mindset" are situated in the GB-minimalism tradition, and I *cannot help* believing in the tenets of that tradition more strongly than I do in alternatives. I can only hope that this undeniable bias does not taint the discussion more than it should.

My own continuing work on control has convinced me, throughout the years, that it is a multidimensional phenomenon. By that I mean that a complete understanding of control – the facts and the principles behind them – cannot be confined to any single module of grammar. Correspondingly, there is no "theory of control," but rather, there are "subtheories of control," which, when assembled together and set to interact via interface principles, yield a comprehensive account of the facts. This view also inspires the organization of this book. Thus, the discussions of obligatory and nonobligatory control are sharply separated because the phenomena are qualitatively different, falling under very different explanations. Complement and adjunct control are similarly distinguished; questions of controller choice, falling within the purview of lexical semantics, are distinguished from questions of case marking and finiteness, which are plainly syntactic, and so on.

The reader will accordingly realize that many of the chapters and sections in this book can be read in isolation, as modular pieces in a big jigsaw puzzle. Many specific topics in control have already produced their own "sub-literature." When a certain section in the book covers one of these topics, I have listed

all the relevant references at the end of the section. Cross-references to related sections and subsections are included to help the reader navigate the book in any itinerary that fits his/her own individual research interests.

Working on this book has been both hard and rewarding. I hope it will stimulate its readers – students and scholars alike – into novel explorations and discoveries in control that have not been contemplated before. This will be my ultimate reward.

Several collegues have read drafts of this work and contributed many valuable comments to improve it. I would like to acknowledge their kind assistance: Peter Herbeck, Marcello Modesto, Johan Rooryck, Ivy Sichel, Anna Szabolcsi, Arhonto Terzi and Coppe van Urk. Parts of this work were written during my sabbatical stay at UC Santa Cruz in 2010; I thank the staff at the linguistics department for their warm hospitality and for providing me with a perfect environment for research. I also owe thanks to Jan Engh and Kristian Emil Kristoffersen, both of whom I do not know personally. Their online bibliography of control (see http://folk.uio.no/janengh/KONTROLL), constantly and meticulously updated for over 15 years now, has been a tremendous resource for me. Finally, bless my wife Shira and my kids Elya and Nimrode, who bring so much joy into my life.

# 1 Background

## 1.1 A historical sketch: the rise and fall of Equi-NP Deletion

The first serious analysis of control in generative grammar is the *Identity Erasure Transformation* of Rosenbaum 1967, 1970, later renamed *Equi-NP Deletion* (Equi, for short). Within the standard theory of the 1960s, all meaning was determined at Deep Structure (DS), and Surface Structure (SS) was derived by applying transformations to DS (e.g., deletion, postposing, reflexivization, pronominalization, movement etc.). The basic intuition behind Equi was straightforward. Since sentences like (1a) really mean (1b), they must be derived from them by a deletion rule, as in (1c).

(1) a. Sally preferred to sleep on the couch.
b. Sally preferred for Sally to sleep on the couch.
c. Sally preferred ~~for Sally~~ to sleep on the couch.

Rosenbaum (1970) stated the rule as follows.

(2)

| W | (NP) | X | {for,POSS} | NP | Y | (NP) | Z | |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ⇒ |
| 1 | 2 | 3 | Ø | Ø | 6 | 7 | 8 | |

(i) 5 is erased by 2.
(ii) 5 is erased by 7, where a constituent A is erased by a constituent B, e.g., A ⇒ Ø, just in case A and B meet the conditions imposed by the Principle of Minimal Distance (PMD).

The deletion rule is constrained in two important ways. First, it only applies to identical and coreferential NPs. Thus, Equi cannot derive (1a) from *Sally preferred for Denise to sleep on the couch*. Second, Equi is constrained by locality: the "controller" of deletion must be the closest NP to the deleted subject. Rosenbaum's PMD – later renamed the MDP (Minimal Distance Principle) is stated below.

(3) *Rosenbaum's (1970) MDP*

An $NP_j$ is erased by an identical $NP_i$ iff there is a clause S such that:
(i) $NP_j$ is dominated by S.
(ii) $NP_i$ neither dominates nor is dominated by S.
(iii) For all $NP_k$ neither dominating nor dominated by S, the distance between $NP_j$ and $NP_k$ is greater than the distance between $NP_j$ and $NP_i$, where distance between two nodes is defined in terms of branches in the path connecting them.

Later formulations of the MDP replaced "branch-counting" by the notion of "minimal c-command" to express the same intuition (Larson 1991, Martin 1996, Manzini and Roussou 2000, Hornstein 1999, 2003; see Section 5.1.3).

Rosenbaum argued that Equi and the MDP operate in three major environments: NP, oblique NP or VP complementation. These terms referred to the node immediately dominating the clause (S) whose subject is erased. Thus, verbs whose complements are dominated by (a hidden) NP allow these complements to undergo pseudoclefting (and sometimes passivization) (4); verbs taking PP complements allow pseudoclefting only if the underlying P (*for* or *of*) surfaces (5); finally, complements directly dominated by the matrix VP resist both processes (6).

(4) *NP complementation*: $[_{VP}$ V $[_{NP}$ D N S]]
a. Everyone preferred to remain silent.
b. To remain silent was preferred by everyone.
c. What everyone preferred was to remain silent.

(5) *Oblique NP complementation*: $[_{VP}$ V $[_{PP}$ P $[_{NP}$ D N S]]]
a. I reminded John to visit his ailing mother.
b. What I reminded John **of** was to visit his ailing mother.

(6) *VP complementation*: $[_{VP}$ V S]
a. The doctor condescended to examine John.
b. * To examine John was condescended by the doctor.
c. * What the doctor condescended was to examine John.

Rosenbaum (1967: 95) noted in passing that VP complementation requires identity of the embedded subject with some matrix NP (7a), whereas NP complementation normally does not (7b). Oblique NP complementation patterns with the former in transitive VPs (7c) and with the latter in intransitive VPs (7d).

(7) a. John managed (*for Helen) to finish the soup.
b. John hated (for Helen) to finish the soup.
c. John persuaded me (*for Helen) to finish the soup.
d. John wished (for Helen) to finish the soup.

These variations were not captured by the Equi rule, which simply operated *if* NP identity was established, but did not specify *where* it must. Later analyses of control perceived this as a major flaw in Rosenbaum's system. Furthermore, the distinction between NP- and VP-complementation has been called into question as several scholars observed that passivization and pseudoclefting produce questionable results with most infinitival complements, and the two tests do not always converge (Bowers 1968, Wagner 1968, Stockwell, Schachter and Hall Partee 1973: 511–527). Of the three verb classes above, (4) and (5) have not survived in modern studies of control as linguistically significant categories. Class (6), however, does seem to correlate quite accurately with the class of *untensed complements*, which preclude partial control and form the core of the class of restructuring verbs (see Sections 2.1, 4.1.2, 5.2).

The validity of the Equi analysis has been challenged from the outset. The criticism was two-fold: first, systematic exceptions to the locality principle, the MDP, were noted; second, the very idea that control involves deletion, and deletion of a lexical NP at that, was called into question on semantic grounds. We discuss these two concerns in turn.

Rosenbaum (1967: 68) himself observed the famous counterexample to the MDP – subject control across an object with the verb *promise*. The understood subject of the complement in (8) is *I*, not *John*, although the MDP would pick the latter as the "eraser" NP, being closer to the embedded subject than *I* is.[1]

(8) I promised John to bring the money.

Anticipating much subsequent attempts to "normalize" this exception, Rosenbaum wrote: "there is every reason to interpret this result as advice to look more deeply into the analysis of this particular verb, for we are likely to find that the problem lies not with the erasure principle but with our analysis of the constructions in which this particular verb appears." In Section 5.1.3 we evaluate how successful this advice has turned out to be.

As a matter of fact, *promise* is not alone in challenging the MDP. Chomsky (1968: 58) cited the examples in (9) and Postal (1970) cited those in (10). In all these examples, the understood subject of the infinitive or gerund is controlled by the matrix subject *across* a closer, matrix object.

(9) a. John gave me the impression of working on that problem.
b. John begged Bill to be shown the new book.

(10) a. Bill asked Tom when to fire the canon.
b. I vowed to Zeus to find the thief.

[1] Rosenbaum also observed (92, fn. 13) systematic exceptions to the MDP in *to be allowed to* complements (e.g., *I demand of you to be allowed to come*). We return to control shift in Section 5.1.2.

Postal further pointed out cases of free control like (11), where the understood subject of the gerund could be *Harry*, *Bill* or both (on split control, see Section 5.3).

(11) Harry talked to Bill about kissing Greta.

Much of Postal's (1970) discussion was aimed to show that the target of control is not a full NP, which is deleted, but rather a null pronoun (which he dubbed *Doom*). His argumentation involved observing interpretive parallels between controlled subjects and overt pronouns in parallel constructions (gerund or finite clauses). Not all of his arguments have survived to the present day; below I review two that have.[2]

Consider first the fact that "cataphoric" control resists an indefinite antecedent much like backward pronominalization does.

(12) a. [(*His$_i$) realizing/realization that the world was exploding] worried somebody$_i$.
b. * [PRO$_i$ realizing/the realization that the world was exploding] worried somebody$_i$.

In Sections 5.5 and 7.3 we will see that the actual reasons for the ungrammaticality of (12a) and (12b) are distinct (weak crossover and topicality, respectively). Yet Postal's point stands as a negative argument against the Equi analysis; deletion of an indefinite NP is not independently ruled out (e.g., forward control, *Somebody wanted to interrupt*).

Next consider what Postal called "plural coordinate constraints." The controlled subject in (13a) can only have a plural antecedent because an overt pronoun in that position is so restricted (13b) (and control involves a step of "pronominalization"). In contrast, the free alternation between plural and singular pronouns in (13d) explains the greater range of control readings in (13c).

(13) a. Harriet$_i$ and Betty$_j$ argued about [PRO$_{i+j/*i/*j}$ visiting you].
b. Harriet$_i$ and Betty$_j$ argued about [their$_{i+j}$/her$_{*i/*j}$ visiting you].
c. Harriet$_i$ argued with Betty$_j$ about [PRO$_{i+j/i/j}$ visiting you].
d. Harriet$_i$ argued with Betty$_j$ about [their$_{i+j}$/her$_{i/j}$ visiting you].

As to the choice of controller, Postal observed that it falls under general semantic conditions that apply to the choice of antecedents for subject pronouns

[2] See also Helke 1971 for similar arguments for a pronominal re-analysis of Equi. I use the term "cataphoric control" for examples like (12b), where PRO precedes the intended controller. The traditional term "backward control" has been recently appropriated to refer to cases where the controller is null and the controllee overt (regardless of their linear order); see Section 4.4.2.

in modal complements; this, again, is seen as an argument for a "pronominalization" account of control and against the Equi analysis. We return to these observations in Section 5.1.1.

Brame 1976, Chapter 5, perhaps contains the most systematic critique of the Equi analysis. The upshot of his argumentation is that obligatory control (OC) cannot be established by a derivational rule (such as Equi), since this rule would enter feeding and bleeding relations with other rules (e.g., *there*-insertion, Q-postposition, Dative Shift), producing ungrammatical results. In addition, Brame pointed out a deeper problem with the Equi rule (already perceived in the early 1970s): while this rule dictates that a coreferential embedded subject must be deleted (transforming a D-structure like *John$_i$ wants John$_i$ to sing* into the S-structure *John wants to sing*), it offers no insight into why so many OC predicates do not allow a non-coreferential embedded subject to begin with (**John tried/decided/persuaded Paul (for) Mary to sing*). Thus, the very fact of OC is not explained by the rule.[3] Recognizing this problem, McCawley (1988: 137) distinguishes Equi verbs like *expect*, which trigger obligatory Equi-NP Deletion, from verbs like *try*, which trigger "superobligatory" Equi-NP Deletion (i.e., preclude an uncontrolled embedded subject).

One of the major problems with the Equi theory is that control does not seem to interact with other grammatical processes in the way deletion rules did. In particular, the deleted subject of the nonfinite clause appears to be visible to the syntax even after its purported deletion. Given that Equi was conceived as a cyclic rule, this had the undesired effect of introducing globality into those other processes, such that they will be able to take account of the to-be-deleted subject at any derivational stage. However, global devices are the constant menace of grammatical theory, better avoided if possible.

Consider an illustration from Clements 1975, which involves both Equi-NP Deletion and Super Equi-NP Deletion (Grinder 1970), the rule that produces long-distance control into subject clauses (both Grinder and Clements collapsed the two rules). As Grinder observed, intervening referential subjects block long-distance control; thus *Sue* blocks deletion of the subject of *holding* by *Lorenzo* in (14a).[4]

[3] Brame's conclusion was that control complements are bare VPs. He noted, though, that most of his arguments leave the "dummy" (=PRO) analysis intact. In fact, we will see in Chapter 3 that the VP-analysis is contradicted by positive evidence for a null subject in the infinitive.

[4] Two comments are in order. First, the status of examples similar to (14a) is not entirely clear. The "intervention" they induce may well be defeasible, owing to logophoricity hierarchy rather than syntax per se. We return to examine long-distance control in Chapter 7. Second, the notation $\emptyset_i$ is, strictly speaking, a theoretical anomaly. Equi analyses assumed radical deletion, which cannot leave an index as a residue. I only use the indices to indicate the controller – the commanding NP that triggered the deletion.

(14) a. * Lorenzo$_i$ thought [that Sue would be impressed [by Ø$_i$ holding his breath for ten minutes]].
b. * Roger$_i$ urged Sue$_j$ [Ø$_j$ to declare that [[Ø$_i$ torturing himself] would be fun]].

Clements observed that (14b) appears to induce the same kind of intervention: *Roger* cannot delete the subject of *torturing* across the subject of *to declare*. The latter subject, however, is Ø$_j$, which may well have been deleted by Equi from *Sue* by the time Super-Equi from *Roger* is evaluated. Moreover, the overt object *Sue* cannot itself be the intervener, as clausemates do not intervene for each other (Grinder 1970; cf. *Roger told Sue that torturing himself would be fun*). Thus, in order to block Super-Equi at the matrix cycle between *Roger* and the subject of *torturing*, the presence of a subject for *to declare*, *at an earlier cycle*, must be registered.

This global device, Clements suggested, is unnecessary if control is viewed as an interpretive dependency between an overt NP and a null subject (Δ). Since this subject is present at all derivational stages, its intervention capacity is unaffected by any control relation it may enter.

Clements also pointed out that split control poses a problem for the Equi analysis, as it does for any transformational approach to pronominalization, which is governed by identity. Neither one of the split antecedents in (15) could singly trigger the deletion of the most embedded subject (note that the antecedents occur in different cycles).

(15) Harry$_i$ said that [Joan$_j$ knew that [it was necessary [Ø$_{i+j}$ to report their own father to the authorities]]].

Let us turn now to the semantic problems for the Equi analysis. The most famous one involves sentences with quantified controllers (see Partee 1975, though the observation is cited without a source). The following pair is from McCawley (1988: 120).

(16) a. Every contestant expects to win.
b. Every contestant expects [every contestant to win].

If (16a) had been derived from (16b) by deletion of the embedded subject *every contestant* under identity with the matrix subject, the two sentences should have been synonymous. Yet clearly they are not: (16b) ascribes an absurd expectation to every contestant (namely, that every contestant will win) while (16a) ascribes to every contestant the perfectly reasonable expectation that she or he themselves will win. This observation strongly suggests that the controlled missing subject is better construed as a bound pronoun or reflexive than as a full NP, identical to the controller.

That Equi deletes a bound variable rather than a full NP was explicitly defended in Morgan 1970. Morgan noted that the original Equi rule falsely predicted certain semantic inferences. According to this rule, the underlying

form of the bracketed S in (17b) is the bracketed S in (17a). Thus, it is not clear why the former is not felicitious in a context where the latter is.[5]

(17) a. John is waiting for me to be introduced, and I'm waiting [$_S$ for me to be introduced], too.
b. * John is waiting for me to be introduced, and I'm waiting [$_S$ to be introduced], too.

On the other hand, if the deleted subject in the second conjunct of (17b) is a bound variable, it is distinct from the subject of the parallel clause in the first conjunct – namely, the constant *me* – hence the semantic implication carried by *too* is not guaranteed.

The other option, namely that Equi deletes underlying reflexives, was proposed in an oft-cited argument by Fodor (1975: 133–145). Fodor observed that (18a) is understood along the lines of (18b), and that among the options in (19), only the reflexive subject option (19a) is equivalent to (18).

(18) a. Only Churchill remembers [___ giving the speech].
b. (Only Churchill)$_i$ [$x_i$ remembers $x_i$ giving the speech].

(19) a. Only Churchill remembers [himself giving the speech].
b. Only Churchill remembers [him giving the speech].
c. Only Churchill remembers [Churchill giving the speech].

Note that (18a) and (19a) display (to use Fodor's term) a curious "epistemic privacy," which is absent in (19b–c): remembering giving the speech is something that only whoever gave the speech can do. Indeed, in the actual world in Churchill's days, (18a)/(19a) were true and (19b–c) false.

Why not assume, then, that the underlying subject of the gerund is a "deep variable," as in (18b)? Fodor argued that such an analysis (even if "deep variables" are admissible elements of DS) would run into problems explaining sloppy identity phenomena in inferences like the following.

(20) a. The cat wanted to eat the cheese.
b. The mouse got what the cat wanted.
∴ The mouse got to eat the cheese.

Whether the underlying subject of *to eat* in (20a) is *he* or *x* bound by *the cat*, there is no explanation for the obligatory shift in reference to *the mouse* as the subject of *to eat* in the conclusion. An underlying *reflexive*, however, would be necessarily bound by the local matrix subject, as required of reflexives in general.

Notice that Fodor's negative argument against the original formulation of Equi is compelling: the deleted embedded subject cannot be a full NP identical to the controller, for semantic reasons. The positive part of the argument,

[5] Notice that *me* in (17a), as part of a repeated constituent, is destressed, so appealing to stress as an obstacle to Equi would not do.

however, is less than conclusive. Specifically, a *bound* variable (as opposed to a free variable) in the position of the controllee, as suggested by Morgan (1970), would produce the reading in (18b) and the sloppy identity in (20). Furthermore, these readings may arise from other processes (admittedly, such options were not developed in the mid-1970s). One option is to treat nonfinite complements as properties in the semantics. Indeed, Chierchia (1984) argued precisely for this analysis on the basis of inferences very much like the one in (20) (see (115) in Section 2.1). Another option is that syntactic operations "tag" two positions as co-varying variables; e.g., the Agree operation of recent minimalism (Chomsky 2000).

The myriad problems with the Equi-NP Deletion analysis led many linguists, during the 1970s and 1980s, to raise more fundamental doubts about it. In particular, the very assumption that nonfinite complements are clausal – hence, project a syntactic subject – was called into question by syntacticians and semanticists alike. For a while, the notion that control complements are bare VPs was quite pervasive (see Thomason 1974, 1976, Brame 1976, Bresnan 1978, Bach 1979, Chierchia 1984, Dowty 1985, Culicover and Wilkins 1986). Undoubtedly, the VP analysis is more intuitive than the clausal analysis in that it invokes no abstract morpheme (namely, PRO).[6]

However, syntactic evidence for the reality of PRO has gradually accumulated during these years. And so, by a curious twist of irony, a basic ingredient of the Equi analysis was revived – that is, the idea that controlled complements contain a null subject – even though the actual deletion part of that analysis was unanimously discarded. In Chapter 3 we review the extensive crosslinguistic evidence for the existence of a structural subject in controlled clauses.

## 1.2 Raising-control contrasts

It is a standard practice in syntax textbooks to introduce control in opposition to raising. There are good reasons behind this practice. First, on a first encounter, the contrast is surprising. Control and raising constructions look misleadingly similar. Differences between them – and there are plenty, as we will see immediately – are only revealed by grammatical analysis. This startling disparity between intuitive classifications and linguistic categories is an excellent example of how science reshapes our perception of the world of phenomena. Moreover, although linguists sharply differ in their theoretical

[6] Interestingly, Chomsky 1955: 246–250, citing (i)–(ii) below, took the transparency of control verbs to selection and agreement as an argument for assimilating them to *auxiliary* verbs (e.g., Aux → *want to*, *fail to* . . . ). This also implied a VP analysis of infinitives and gerunds.

(i) a. The law covers these cases / #The law eats lunch
b. The law fails to cover these cases / #The law fails to eat lunch

(ii) a. John wants to be an officer / *officers.
b. They want to be officers / *an officer

accounts of raising and control, they still share a core understanding of what makes these grammatical phenomena different. The fundamental insight has remained the same from its earliest statement (see Chomsky 1965: 22–24). It is a cornerstone discovery of generative grammar, and one that makes a superb gateway into the field.

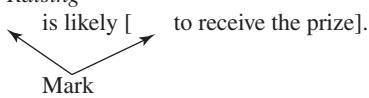
In this section, I survey a large number of empirical contrasts between raising and control.[7] Some of them go to the earliest studies (Rosenbaum 1967) while others have been accumulated over the years, as the predictions of specific theoretical accounts became increasingly refined. Before embarking on the data, however, let us remind ourselves of the basic nature of the two constructions.

In a raising construction, one observes a mismatch between the semantic (or thematic) role of an argument and its syntactic location. Specifically, a DP that receives a θ-role from an embedded (usually nonfinite) predicate appears in a syntactic position that is part of the matrix clause. On a hierarchical view of syntactic organization, it is natural to say that the DP has raised from the embedded to the matrix clause. Importantly, the "original" and the "ultimate" positions are associated with a *single* notional argument; this is sometimes dubbed "structure sharing."

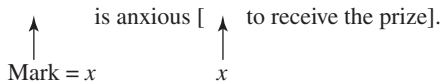
In a control construction, one also observes a mismatch, but of a different kind. Here we have a single visible argument that appears to be associated with *two* semantic roles. While its syntactic position corresponds to the matrix θ-role, the interpretation of the sentence indicates that there is an additional, invisible argument in the embedded clause, which is coreferential with (bound/controlled by) the overt DP. Importantly, the two positions are associated with *two* notional arguments; the relation between them is more akin to *anaphora* than to structure sharing.

We schematize these properties in (21)

(21) a. *Raising*




b. *Control*




[7] For useful surveys, see Postal 1974, Landau 2003, Davies and Dubinsky 2004: 3–16 and Kirby, Davies and Dubinsky 2010. Note that the solidity of the raising-control distinction does not imply that classifying particular verbs in particular languages as either raising or control is necessarily trivial. In fact, intriguing "imposters" exist (on either side) whose proper analysis remains controversial (for relevant examples, see Ruwet 1972, Rooryck 1992, Kotzoglou and Papangeli 2007, Barrie and Pittman 2010, Sportiche 2010).

In (22), these ideas are translated to common linguistic notation. The struck-through DP in (22a) is an unpronounced copy – the modern incarnation of *trace*. The movement from the trace position to the matrix position creates *a chain*, which is just the syntactician's way of saying that properties of single DP are distributed in two positions (e.g., thematic properties are located in the low position, phonological properties in the high one). The PRO in (22b) is an unpronounced pronoun (or reflexive), which is an independent argument; its relation with the matrix position is *a referential dependency* (leaving open for the moment its syntactic underpinnings).

The reader should bear in mind that the actual grammatical representation of raising and control is a matter of much dispute. While we do not discuss raising in this book (beyond the present section), in Chapter 2 we present a broad survey of the different theoretical approaches to control. The representations in (21)–(22) should only serve to facilitate the intuitive grasp of the raising-control distinction.

(22) a. *Raising*
Mark$_i$ is likely [~~Mark~~$_i$ to receive the prize].

b. *Control*
Mark$_i$ is anxious [PRO$_i$ to receive the prize].

Both raising and control predicates come in two versions. In one version, the matrix dependent is a subject (as in (22)), and in the other one it is an object. We provide below a sample from each category (drawn from the English vocabulary).

(23) a. Raising to Subject
*seem, appear, turn out, happen, begin, continue, stop, likely, certain, sure*.

b. Raising to Object
*believe, consider, prove, show, take, expect, allow, prevent, depend on*.

(24) a. Subject control
*try, condescend, promise, decide, plan, agree, hope, prefer, wonder, refrain*.

b. Object control
*persuade, encourage, recommend, appeal, force, plead, order, urge, dissuade*.

Let us turn now to the empirical contrasts between the two constructions. I begin with *interpretive* contrasts (Section 1.2.1) and then turn to *structural* contrasts (Section 1.2.2). The distinction is expository and not principled; some of the interpretive contrasts, in fact, ultimately reduce to the structural

distinction between the presence of one A-chain in raising (22a) vs. two A-chains (one of the controller, one of PRO) in control (22b).[8]

### *1.2.1 Interpretive contrasts*

**Expletive subjects**. Since raising predicates assign no θ-role to their subject, they can occur with an expletive subject whenever raising fails to apply; note the virtual synonymy of (25a)–(25b) and (25c)–(25d). The 'quasi-argument' subject of weather predicates can also raise (25e–25f). Control predicates, on the other hand, always take argumental thematic arguments, so expletives are disallowed (26).

(25)
a. John seems to be happy.
b. It seems that John is happy.
c. We proved John to have visited the house.
d. We proved it that John had visited the house
e. It appears to be snowing there all winter.
f. I expect it to be snowing there all winter.

(26)
a. John hopes to be happy.
b. * It hopes that John is happy.
c. We convinced John to visit the house.
d. * We convinced it that John should visit the house.
e. * It wished to be snowing there all winter.
f. * I appealed to it to be snowing there all winter.

**Idiom chunks**. Tapping onto the same point, raising predicates may occur with nonthematic arguments – expletives or idiom chunks – unlike control predicates. For expletives, the explanation is the same as given for (25)–(26). For idiom chunks, we assume that they are only interpretable as part of their idiom, i.e., within the minimal idiomatic phrase. Since the raised DP is, in fact, part of the embedded clause, this is unproblematic (in modern terms, we may say that LF (logical form) targets the unpronounced, lower copy of the raising chain). In control, however, the matrix DP never was a part of the embedded clause; thus it must be interpreted referentially, as an argument of the control predicate, leading to the loss of the idiomatic reading (in the sentences below, raising predicates precede the slash, control predicates follow it).

[8] That raising and control display syntactic contrasts was explicitly denied in Bowers 1973, 1981. In fact, Bowers contended that the two constructions are structurally indistinguishable, their differences being purely semantic. This unity is explained if control is a species of raising (and consequently, D-structure, as the exclusive locus of lexical insertion, does not exist). The reader will realize that this optimism was premature; while current syntactic theories dispense with D-structure, the facts in this section (and in particular, in Section 1.2.2) clearly point to a structural *dis*unity between raising and control. Bowers' position was updated in Hornstein 1999, 2003, reviving interest in the empirical basis for the distinction between raising and control; see Section 2.4 and references therein.

(27) a. My leg appeared / #attempted to have been pulled.
b. There is likely / *eager to be a riot in the town square.
c. I don't expect / #urge my leg to be pulled.
d. The police prevented / *dissuaded there from being a riot in the town square.

**Scope reconstruction I**. The fact that there is a semantically accessible copy of the matrix DP inside a raising complement but not inside a control complement yields different predictions regarding certain scope interactions. Notice first that most raising and control predicates are scope-bearing elements in virtue of being intensional. Arguments that are interpreted within the intensional scope of the predicate will carry existence presuppositions only with respect to the possible worlds (of belief, desire etc.) that are introduced by the predicate. Conversely, arguments that are interpreted outside the intensional scope of the predicate will carry existence presuppositions in the actual utterance world.

Now, quite generally, the intensional scope of attitude verbs is the complement clause. Therefore, embedded arguments take narrow scope with respect to the matrix predicate, whereas matrix arguments take scope over it. Since raised DPs retain an identical copy inside the complement, they are expected to display a scope ambiguity with respect to the matrix predicate (depending on which copy of the DP is interpreted); on the contrary, since controller DP subjects have no copy in the complement, they are expected to take unambiguous scope over the matrix predicate.

(28) a. *Raising*
$DP_i$ . . . Pred . . . [~~$DP_i$~~ to VP]
scope (i): DP≫Pred; scope (ii): Pred ≫DP
b. *Control*
$DP_i$ . . . Pred . . . [$PRO_i$ to VP]
scope (i): DP≫Pred; scope (ii) unavailable: *Pred ≫DP

This prediction is confirmed.

(29) a. Seven civilians are likely to starve to death this weekend.
b. Seven civilians are afraid to starve to death this weekend.

The raising sentence (29a) could be interpreted either as "It is likely that seven civilians (whoever they might be) will starve to death this weekend," or as "Seven specific civilians, namely John, Peter, Nancy etc., are likely starve to death this weekend." The former reading assigns narrow scope to *seven civilians*, the latter wide scope. Observe that the control sentence (29b) only has a reading corresponding to the latter; namely, there are seven specific civilians who are afraid to starve to death this weekend. There is nothing like a

narrow scope reading (which would roughly mean "There is general fear that seven civilians (whoever they might be) will starve to death this weekend").

Raising to object and object control contrast the same way.

(30) a. Poirot proved at least two collaborators to have killed the duchess.
b. Poirot asked at least two collaborators to kill the duchess.

Raising to object in (30a) allows a narrow scope reading for the raised DP ("Poirot proved that at least two collaborators had killed the duchess"). On that reading, the identity of the collaborators is unknown (perhaps Poirot simply traced two distinct foot trails). Object control in (30b) excludes such a reading; there must have been at least two specific collaborators whom Poirot approached in his request.

**Scope reconstruction II**. The following pair makes a similar point, the interaction now being between negation and the universal quantifier (Baltin 2009). Whereas the raising example is ambiguous, the control example only admits wide scope for the universal quantifier.

(31) a. I prevented the entire team from leaving. *Raising*
∀>>¬: "I brought it about that the entire team stayed (not-left)."
¬>>∀: "I brought it about that part of (not the entire) team left."
b. I dissuaded the entire team from leaving. *Object control*
∀>>¬: "I persuaded the entire team that it should stay (not-leave)."
*¬>>∀: *"I persuaded the entire team that part of it (not all) should leave."

Abstracting away from their minor differences, Landau (2002) and Baltin (2009) assume that the negative meaning resides with *from*, which is a prepositional complementizer of sorts. Furthermore, there is evidence that raising with *prevent* is "short," stopping at [Spec,*from*]. The two structures are given below (for simplicity, I do not represent the VP-internal trace inside the gerund).

(32) a. I prevented [$_{CP/PP}$ the entire team [from$_{NEG}$ ~~the entire team~~ leaving]].
b. I dissuaded the entire team$_i$ [$_{CP/PP}$ from$_{NEG}$ PRO$_i$ leaving].

The scope ambiguity of (32a) is explained by the presence of two copies of *the entire team* in the structure – one above negation (i.e., *from*) and one below it. The lack of ambiguity in (32b) follows from the fact that there is only one copy of *the entire team* in the structure, and it is higher than negation.

**Scope reconstruction III**. The lower copy of the raised DP should be able not only to scope under the matrix predicate, but also to participate in binding relations established in the complement clause. For example, if the raised DP contains an anaphor, it should be able to pick an embedded antecedent by virtue of the lower copy. In contrast, since PRO has no internal structure which

mirrors the structure of the controller, an anaphor inside a controller should be unable to pick an embedded antecedent.[9]

To test this prediction, we use familiar cases of backward binding by an object into a subject. Notice, crucially, that the relation is clause-bound.

(33) a. [Friends of each other$_i$] amused the men$_i$.
b. * [Friends of each other$_i$] wanted Mary to amuse the men$_i$.

This clause-boundedness appears to be suspended in one case only – raising predicates. An anaphor inside the matrix subject can be bound by the embedded object provided the subject has raised from the embedded clause. (34b) depicts the LF structure of (34a); the relevant copy of *each other*, which satisfies the binding condition (however it is stated for backward binding), is struck through.

(34) a. [Friends of each other$_i$] seemed to amuse the men$_i$.
b. [Friends of each other$_i$] seemed [[~~friends of each other~~$_i$] to amuse the men$_i$].

Controlled PRO cannot redeem backward binding in this fashion, for the reason already noted above: PRO is not a reconstruction site (but a trace is).[10]

(35) * [Friends of each other$_i$]$_j$ wanted [PRO$_j$ to amuse the men$_i$].

**Scope reconstruction IV**. An illicit Weak Crossover configuration arises whenever a quantifier binds, at LF, a pronominal variable that occurs to its left at S-structure (in a non-c-commanding position). Interestingly, if the pronominal variable has moved from an A-position c-commanded by the base position of the quantifier, Weak Crossover is avoided. That is, LF binding may licitly apply, under resonstruction, between the base copy of the quantifier and the base (reconstructed) copy of the pronoun.

This possibility, of course, is only available for pronouns contained in moved DPs but not for pronouns in unmoved DPs; hence it distinguishes raising and control in a fully predictable way.

[9] The relevant facts were first noticed in Langendoen and Battistella 1982: fn. 7.

[10] This asymmetry was challenged in Takano 2010 on the basis of scrambling data from Japanese. Briefly, a QP can take scope over a pronominal variable by scrambling to the left of the variable – but only clause-internally; long-distance scrambling does not produce new binding possibilities. Takano shows that in control structures, an embedded QP object can successfully bind a matrix pronoun by scrambling to its left, but only if the pronoun is contained in the controller. The claim is that the controller originates as the subject of the embedded clause (as in the A-movement theory; see Section 2.4) and the QP first scrambles in that clause to the left of the subject copy, thereby establishing binding. Takano's analysis is incompatible with the reconstruction data discussed in the text; furthermore, even in Japanese, it fails to extend to subject control across an object (*promise*-type), forcing the dubious assumption that these are not OC constructions. Coupled with Fujii's (2006, 2010) analysis of split-control (also couched within the A-movement theory), Takano's analysis predicts that either one of the split controllers will be available for binding by a scrambled QP – contrary to fact (see Imaoka 2011 for details).

(36) a. *Raising*
His$_i$ employees appeared to every boss$_i$ to be surprisingly efficient.
b. *Control*
??His$_i$ employees promised to every boss$_i$ to be more efficient.

Thanks to the presence of a full (albeit unpronounced) copy of the raised DP *his employees* in the embedded subject position of (36a), the pronoun inside that copy may be licitly bound from the base position of the quantifier *every boss*. Controlled PRO in (36b), in contrast, has no internal structure, hence provides no pronominal variable for the quantifier to bind.

(37) a. No WCO: His$_i$ employees . . . every boss$_i$ . . . [~~his$_i$employees~~ . . . ]
b. WCO: [His$_i$ employees]$_j$ . . . every boss$_i$ . . . [PRO$_j$ . . . ]

**Equivalence under passive**. Raising and control predicates differ in their adicity. Raising to subject predicates are monadic, their single logical argument is the propositional complement.[11] Most subject control predicates are dyadic, relating an individual and an eventuality (a few are triadic, involving a goal/source as well). Raising to object predicates are also dyadic, while object control predicates are triadic, relating two individuals and an eventuality.

Whether the propositional argument is expressed in the active or the passive voice makes no truth-conditional difference. Thus, (38a–38b) are equivalent and (39a–39b) are too (although each pair reflects the effect of passive on information structure).

(38) a. It seemed that a specialist examined John.
b. It seemed that John was examined by a specialist.

(39) a. I expected that a specialist would examine John.
b. I expected that John would be examined by a specialist.

So far, no surprise here. Notice now that this active-passive equivalence carries over to the raising versions of *seem/believe*. Again, the members of each pair are truth-conditionally equivalent.

(40) a. A specialist seemed to have examined John.
b. John seemed to have been examined by a specialist.

(41) a. I expected a specialist to examine John.
b. I expected John to be examined by a specialist.

The natural explanation for this parallelism is to assume that the two members of each pair are logically isomorphic. Since throughout this paradigm *a specialist* is the agent of *examine* and *John* is the patient, it makes no difference

[11] This is not quite true of *seem/appear*, which also select a (possibly implicit) experiencer argument. The point remains, however, that the raisee is not an argument of the raising predicate.

(for θ-assignment purposes) whether and which one of them has raised; the basic predicate-argument structure of the event remains constant.

In contrast, the logical equivalence breaks down in control active-passive pairs.[12]

(42) a. A specialist intends to examine John.
b. John intends to be examined by a specialist.

(43) a. I persuaded a specialist to examine John.
b. I persuaded John to be examined by a specialist.

The intender in (42a–42b) switches from *a specialist* to *John*; so does the persuadee in (43a–43b). For this reason, the members of each pair are not equivalent. Although the person examined in (42b) and (43b) is still understood to be *John*, this understanding results from the presence of a PRO subject in the infinitive, which is controlled by *John*. The latter DP, unlike in (40)–(41), receives an independent θ-role from the matrix verb.

**Antipronominal environments**. Further interpretive contrasts between raising and control hinge on the distinction between the type of element postulated in the embedded subject position – a lexical DP in raising, a pronoun (of sorts) in control; cf. (22). Grammatical environments that are sensitive to this contrast may serve to establish the distinction from an independent angle.

Postal (2004: 94–102) discusses two such environments. He notes that predicates like *be the matter/wrong with* prohibit pronominal subjects (induce "antipronominal" environments).

(44) a. Something$_i$ is the matter with my transmission, but that sort of thing/*it$_i$ is not the matter with his.
b. * He said something$_i$ was wrong with her values, and it$_i$ was wrong with them.

Interestingly, these two predicates may occur inside raising complements, but not inside controlled clauses.

(45) a. Lots of things seem to be the matter with your transmission.
b. Such a thing is bound to be wrong with someone's liver.

[12] This is probably the earliest documented contrast (see Chomsky 1965: 22–24). Chomsky took it to be emblematic of the marvels of linguistic inquiry, writing that (example numbers were adjusted to the present text): "The example (41a)/(43a) serves to illustrate two important points. First, it shows how unrevealing surface structure may be as to underlying deep structure. Thus (41a) and (43a) are the same in surface structure, but very different in the deep structure that underlies them and determines their semantic interpretations. Second, it illustrates the elusiveness of the speaker's tacit knowledge. Until such examples as (41b) and (43b) are adduced, it may not be in the least clear to a speaker of English that the grammar that he has internalized in fact assigns very different syntactic analyses to the superficially analogous sentences (41a) and (43a)."

(46) a. * Lots of things can be the matter with your transmission without being the matter with mine.
b. * That can be detectable without being wrong with your liver.

The contrast is explained if PRO is a null pronominal (or reflexive) of sorts, whereas the trace of a raised DP is simply a silent copy of this DP, retaining all its distributional properties.

**Metonymous shift**. Postal's second observation pointing to the pronominal nature of PRO involves antecedence relations between certain DPs and their metonyms. Observe first that pronominal antecedence tolerates certain metonymous shifts but not others.

(47) a. I am parked on 26th Street (= my car is parked on 26th Street).
b. Microsoft went up (= Microsoft's stock's price went up).

(48) a. $\text{John}_i$ claimed that $\text{he}_i$ was parked on 26th Street.
b. * $\text{Microsoft}_i$ claimed that $\text{it}_i$ would go up.

Thus, for whatever reason, a pronoun may be metonymous to its antecedent in the case of a car-possessor relation, but not in the case of a company-stock's price relation.[13] Crucially, the same contrast is preserved in control, but not in raising.

(49) a. John plans to be parked on 26th Street.
b. * Microsoft plans to go up.

(50) a. John seems/is likely to be parked on 26th Street.
b. Microsoft seems/is likely to go up.

The fact that (49b) patterns with (48b) and not with (50b) strongly suggests that the null subject of the control complement is more akin to a pronoun than to a trace. Postal further shows that a "stock price" PRO *can* be controlled, provided its antecedent is construed as a stock price as well.

(51) Microsoft went up today after going down yesterday.

Therefore, the problem with (49b) is specifically the metonymous *shift*, which is independently shown to be restricted for pronouns (as well as reflexives, e.g., **Microsoft believes itself to have gone up*). No such shift is required in (50b), where the embedded null subject is nothing but a silent copy of the matrix subject.

**Partial control**. One interpretive option open to control, which we will discuss at length in Section 5.2, is *partial control*. In these situations, the reference of PRO properly includes the reference of the controller. Such cases

[13] Notice that there is nothing wrong about treating companies as agents or attitude-holders; compare (48b) with *$\text{Microsoft}_i$ claimed that $\text{its}_i$ stock price would go up*.

are perfectly natural when the speaker has some salient group in mind. For example (the notation $DP_i \ldots PRO_{i+}$ indicates the partial control reading):

(52) We thought that . . .
a. The chair$_i$ preferred [PRO$_{i+}$ to gather at 6].
b. Bill$_i$ regretted [PRO$_{i+}$ meeting without a concrete agenda].
c. Mary$_i$ wondered [whether PRO$_{i+}$ to apply together for the grant].

However one obtains the partial control reading, it seems pretty obvious that an A-chain dependency would fall short of doing so. Chain copies are identical elements; for one copy to denote a subset of another copy seems practically impossible. A pronominal (or even anaphoric) dependency, however, may well tolerate such mismatches (e.g., *John$_i$ said they$_{i+}$ were happy*; see also Kawasaki 1989 on inclusive anaphors).

Indeed, minimal raising-control pairs illustrate the contrast. Note that irrealis tense in the complement is sufficient to license partial control in control complements (53). Comparable interpretations in irrealis raising complements are excluded (54).

(53) a. We thought that the chair was willing to gather once more.
b. We urged the chair to gather once more.

(54) a. * We thought that the chair was likely to gather once more.
b. * We expected the chair to gather once more.

The nine interpretive contrasts between raising and control surveyed in this section are theoretically unified by two assumptions. First, in raising but not in control there is a full copy of the matrix DP in the embedded subject position, which is accessible to semantic interpretation. Second, in control and not in raising there is a pronominal element in the embedded subject position.

### *1.2.2 Structural contrasts*

**CP vs. TP complements**. The first structural contrast concerns the size of the complement clause. It has been observed, time and again, that raising complements are smaller than control complements; in particular, the former are TPs while the latter are CPs. The basic empirical motivation for this claim is the following observation.

(55) Control complements may be introduced by complementizers;
raising complements are never introduced by complementizers.

There are a number of ways to make theoretical sense of this generalization. They all share the insight that the locality conditions on A-chains (or structure sharing) are stricter than those constraining control (or anaphoric dependencies). Specifically, an intervening CP node intercepts A-movement

but not control. The reason may have to do with the nature of CP-crossing A-movement ("The Ban on Improper Movement") or Chomsky's (2000) Phase Impenetrability Condition. We will not try to derive this generalization but simply illustrate its consequences.

Infinitival complementizers have been recorded in many languages. Strikingly, they are found only in control contexts, not raising contexts. Even when such a complementizer appears to introduce a raising complement, closer examination reveals a control alternant. Consider the following pair in Hebrew (Landau 2002).

(56) a. Rina$_i$ xadla [(me-) PRO$_i$ le'acben et Gil].
Rina stopped (from-) to.irritate ACC Gil
'Rina stopped irritating Gil.'

b. Ha-muzika ha-ro'ešet$_i$ xadla [(*me-) t$_i$ le'acben et Gil].
the-music the-noisy stopped [(*from-) to.irritate ACC Gil
'The loud music stopped irritating Gil.'

Landau (2002) shows that *me-* is an infinitival complementizer associated with "negative" complements, parallel to *from* in (31)–(32). The verb *xadal* "stop, cease" belongs to a class of aspectual verbs that are systematically ambiguous between raising and control (Perlmutter 1970). Typically, only animate DPs can control. Notice that the complementizer may appear only when the matrix subject is animate (56a). The inanimacy of the matrix subject in (56b) forces a raising analysis, which in turn rules out the presence of a complementizer, in accordance with (55).

The effects of (55) extend to languages that employ finite complements in raising and control. In Balkan languages, such complements are typically subjunctive (see Section 4.1.2). In Romanian, subjunctive complements are marked by a designated preverbal particle *să* and a complementizer *ca*; the latter is obligatory whenever the former is preceded by some embedded constituent (57a), and dispreferred otherwise. The single exception is raising complements: they can never be introduced by *ca* (57b), hence are licit only without *ca* and any fronted material (57c) (Dobrovie-Sorin 2001).

(57) a. Vreau *(ca) mâine să vină Ion.
want.1SG COMP tomorrow PRT come.3SG.SUBJ John
'I want John to come tomorrow.'

b. * Copiii tăi par ca pe profesor să fie
the.children your seem COMP PE professor PRT be.3PL.SUBJ
supărați.
angry

c. Copiii tăi par să fie supărați pe profesor.
the.children your seem PRT be.3PL.SUBJ angry PE professor
'Your children seem to be angry with the teacher.'

To the extent that unambiguous complementizers can be identified in any given language, they always display this distributional asymmetry.[14]

**Complement drop**. Since controller DPs are generated independently of the infinitival complement, whereas raised DPs are generated inside it, the latter but not the former require the presence of that complement in order to be licensed. Another way of putting it is that in the case of control, idiosyncratic lexical properties of the control predicate *alone* determine the possibility of complement drop; in the case of raising, however, the very operation of raising cannot take place if the complement clause is not projected.

Indeed, as Jacobson (1992) observes, no raising predicate allows complement drop.

(58) a. * John seems/happens/turns out to be obnoxious, but I don't think that Sam seems/happens/turns out.
b. * John is certain/sure/apt to win, but I don't think Bill is (particularly) certain/sure/apt.
c. * Mary expected/believed/reported Bill to be obnoxious, but I don't think she expected/believed/reported Sam.

On the other hand, nearly all control predicates allow it.[15]

(59) a. John tried/forgot/refused to take out the garbage, and I think that Bill also tried/forgot/refused.
b. John is eager/willing/afraid to leave, but I don't think Bill is eager/willing/afraid.
c. Mary persuaded/asked/told Sam to leave, but I don't think she has yet persuaded/asked/?told Bill.

Notice that this contrast follows straightforwardly from the derivational distinction between raising and control – but *only* on a very specific view of complement drop. In particular, this process must be genuinely equivalent to

[14] In some languages a morpheme can be used as a complementizer in one environment and as a verbal proclitic in others, giving rise to apparent counterexamples to (55). Kayne (1981) argued that Italian *di* and French *de* are complementizers, noting their presence in some control complements versus their absence from the complement of *sembrare/sembler* "seem." However, *di/de* occur with complements of aspectual verbs (e.g., *begin*, *finish*), which display all the characteristics of raising (Rochette 1988: 180). The particle *að* in Icelandic displays a similar split, occurring with modal and aspectual complements but not with the propositional raising complements of *seem/believe*. Possibly, as Thráinsson (1986) proposed, modal and aspectual complements are bare VPs; if so, whatever the status of the particle that introduces them is, it is not a complementizer.

[15] Jacobson notes that some subject control predicates do not permit complement drop (e.g., *want*, *attempt*, *desire*), but all object control verbs and control adjectives do. Still, no Raising-to-Object or raising adjective permits complement drop. This state of affairs suggests that those subject control verbs that resist complement drop are truly exceptional and should be lexically marked. Indeed, their counterparts in other languages (e.g., Hebrew) freely allow complement drop.

"non-generation" and not to ellipsis. It is well known that extraction can target material inside ellipsis sites (e.g., *I don't know what Mary bought, but I know what$_i$ Bill did [~~buy what$_i$~~]*). If complement drop of infinitives were simply ellipsis – syntactic projection of material that is not pronounced – we would have expected the missing raising complements in (58) to be legitimate environments for an internal trace (as elided VPs are). The facts suggest that this is not an option.[16] Rather what is involved is a lexical manipulation of the raising or control predicate, suppressing its clausal argument and preventing it from projecting to the syntax; indeed, the few exceptions mentioned in fn. 15 support the idea that the process is lexically governed, unlike ellipsis, which is syntactically conditioned.

**Unaccusative properties**. A salient difference between the subject of a raising predicate and the subject of a control predicate is the fact that the former is *derived*. Since raising verbs project no external argument, they qualify as *unaccusative* predicates. By contrast, subject controllers are always external arguments; hence, their predicates are unergative or transitive. We therefore predict that raising predicates will pass unaccusativity tests and control predicates will not.[17]

Ruwet (1972) observed that raising verbs permit *en*-cliticization of the partitive complement of their surface subject on the *embedded* verb, whereas control verbs do not (see also Rooryck 1992). As is well known, *en*-cliticization is a diagnostic of A-movement in French, found with passive and unaccusative subjects as well (data from Landau 2003).

(60) a. Le directeur du département semble être accepté. *Raising*
the head of.the department seems to.be accepted
'The head of the department seems to be accepted.'

b. [Le directeur ~~en~~]$_i$ semble [[~~le directeur en~~]$_i$ *en* être accepté [~~le directeur en~~]$_i$].

(61) a. Le directeur du département espère être accepté. *Control*
the head of-the department hopes to.be accepted

b. * Le directeur$_i$ espère [PRO$_i$ *en* être accepté ~~PRO~~$_i$].
'The head of the department hopes to be accepted.'

Assume that traces are copies of the moved element, with identical internal structure. The raising (passivized) complement in (60b) contains two fully deleted copies of the raised DP, and one pronounced subcopy, *en*, cliticized onto the infinitival verb. Presumably, cliticization preceded passivization (so,

[16] Why "CP ellipsis" is not an option is a question we do not address. Possibly this is related to Lobeck's (1995) condition that elided constituents be sisters of agreeing functional heads.

[17] This is an oversimplification. A few nonagentive control verbs (e.g., *manage*) are unaccusative in some languages. The point is that even internal argument controllers do not originate in the complement clause.

in effect, the embedded subject is a remnant). In contrast, the object-turned-subject in the control complement of (61b) is PRO – a simplex morpheme, which cannot host an internal copy of the clitic. Hence, there is no source for the embedded *en* in (61b).

Consider next *si*-reflexivization in Italian. Rizzi (1986b) showed that A-movement cannot skip a position coindexed with the moved NP, a consequence he derived from the Chain Condition and the θ-Criterion. Specifically, configurations of the sort [$DP_i$ . . . $si_i$ . . . $t_i$] in Italian, where $t_i$ is the trace of $DP_i$ and $si_i$ is a reflexive clitic, are excluded. This serves as an "anti-unaccusative" test in this language: all contexts that involve A-movement – passive, impersonal and unaccusative constructions – fail this test. Not surprisingly, Rizzi showed that raising and control contrast in the expected way.

(62) a. * I due candidati$_i$ *si*$_i$ risultavano [$t_i$ poter vincere].
the two candidates to.each-other appeared to.be.able to.win
'The two candidates appeared to each other to be able to win.'

b. I due concorrentii *si*$_i$ sono promessi [di PRO$_i$ essere leali].
the two competitors to.each-other were promised DI to.be loyal
'The two competitors promised to each other to be loyal.'

As Landau (2003) noted, this contrast is very narrowly tied to the movement/non-movement distinction. While some of Rizzi's assumptions may be questioned (perhaps *si* is the external argument and not the dative; perhaps chains may carry two θ-roles), it is difficult to see how a uniform movement (or non-movement) analysis of both raising and control can derive this contrast in a principled way.

**Subextraction**. Chomsky (1973) pointed out that unlike canonical direct objects in English, the surface object of ECM (exceptional case marking) verbs like *believe*/*expect* is an island for movement. The observation was further addressed in Postal 1974: 188–192.

(63) a. Who$_i$ did you hear [stories about $t_i$]?
b. * Who$_i$ did you expect [stories about $t_i$] to terrify John?
c. Who$_i$ did you find [pictures of $t_i$]?
d. * Who$_i$ did you find [pictures of $t_i$] to be offensive?

Chomsky argued from the ungrammaticality of (63b, 63d) against the Raising-to-Object analysis, the idea being that islandhood is a property of subjects, not objects (cf. **Who$_i$ did you expect that [stories about $t_i$] would terrify John?*). In turn, Postal invoked the global device of a "cyclic subject" (a subject at *some* derivational stage) to handle these examples. Current theory would probably side with Postal's Raising-to-Object analysis and attribute the ungrammaticality of (63b, 63d) to a "freezing effect," typical of derived positions, rather than to (surface or cyclic) subjecthood (see Gallego and Uriagereka 2007).

What neither author seems to have doubted, however, is the transparency of object controllers to subextraction.

(64) [Which famous person]$_i$ did Martha persuade [friends of $t_i$] to sign her program?

Runner (2006), citing (64), pointed out that a unified analysis of raising and control fails to capture the contrast between (63b, 63d) and (64) (for the A-movement theory of control, see Section 2.4). In particular, if the controller DP in the latter is raised from the embedded subject position just like the matrix objects in the former, it should be just as opaque to subextraction.

**Tough movement**. A second contrast between objects derived by raising and object controllers, observed in Chomsky 1973 (and credited to J. Kimball), is the resistance of the former to *tough*-movement (see also Postal 1974: 200, fn. 9 and Runner 2006).

(65)
a. Bill is tough to persuade $t_i$ [PRO to smoke cigars]. *control*
b. * Bill is tough to believe $t_i$ [$t_i$ to smoke cigars]. *raising*
c. Smith was easy for Jones to force $t_i$ [PRO to recover]. *control*
d. * Smith was easy for Jones to expect $t_i$ [$t_i$ to recover]. *raising*

Whether the explanation of this contrast is also related to freezing (hence, to the distinction between nonderived objects in (65a, 65c) and derived objects in (65b, 65d)) is not so clear. Postal suggested that multiple movements may not leave a "trail" of *to* markers; hence a small clause subject *is* a possible target for *tough* movement (e.g., *Melvin would be easy to prove (*to be) guilty*). Note that a similar resistance to *tough*-movement and subextraction is exhibited by the inner object in double object constructions (e.g., see den Dikken 1995b).

**Clausemate relations**. The next contrast hinges on the sensitivity of certain grammatical processes to some "clausemate" condition (i.e., two given elements may not be related if separated by a clause boundary). The phenomenon of *each*-association is one such process. Burzio (1981) noted that control "breaks" the association of *each* with a lower DP, but raising does not ((66a–66c) are cited by Chomsky (1981: 61)).

(66)
a. One interpreter$_i$ each was assigned $t_i$ to the visiting diplomats.
b. One interpreter$_i$ each seemed [$t_i$ to have been assigned $t_i$ to the visiting diplomats].
c. * One interpreter$_i$ each tried [PRO$_i$ to be assigned $t_i$ to the visiting diplomats].
d. * One interpreter$_i$ each said that [he$_i$ had been assigned $t_i$ to the visiting diplomats].

Notice that an A-trace/copy does not interfere with *each*-association (66a–66b), whereas PRO, just like an overt pronoun, does (66c–66d). Suppose that

*each*-association is clause bound, so that the DP denoting the set over which *each* distributes, or its copy, must be clausemate to *each*. This is satisfied in the raising case (66b), but not in the control case (66c) – *only* under the assumption that the embedded subject in the latter is *not* a copy of the controller.

**Overt embedded subject**. The next two contrasts involve infinitival complements in which the subject is spelled out as a pronoun – an option available in a number of null subject languages (see Section 4.4.1 for further discussion). These pronouns are often (though not necessarily) accompanied by a focus particle, and for this reason were analyzed as "emphatic pronouns" (Burzio 1986). Szabolcsi (2009) and Barbosa (2009), however, provide compelling evidence that at least in certain languages (e.g., Hungarian, Italian, European Portuguese) these are genuine subjects; in raising complements, they are simply the unraised subject, and in control complements they are "spelled-out" PRO. Furthermore, when occurring inside the infinitive, these subjects take scope under the matrix verb, as the translations of the examples below illustrate (see Szabolcsi 2009 for discussion of the scope data).

The first contrast concerns the tolerance to embedded lexical subjects. While both raising and control complements can host pronominal subjects, only the former can host a lexical subject. The following examples are from European Portuguese (BP) (Barbosa 2009). Note that the postverbal position of the subject is its base position (the verb raising past it).

(67) a. *Raising*
Não pareço [cantar **só eu/ só o João** nesta gravação].
not seem.1SG to.sing only I/ only the John in.this recording
'It doesn't seem to be the case that only I/John sing(s) in this recording.'

b. *Control*
Decidiu ir **só ele/ *só o João** ao mercado.
decided to.go only he/ only the John to.the market
(i) 'He/John is the only one who decided to go to the market.'
(ii) 'He decided for it to be the case that only he/*John goes to the market.'

In the raising example the subject is unambiguously located inside the complement, hence the low scope with respect to the raising verb. Note that either a pronoun or a lexical DP is grammatical. In minimalist terms, these sentences are analyzed as long-distance Agree between the matrix T and the embedded subject; EPP in the matrix clause is satisfied in whatever way it is normally satisfied in VSO sentences (see Barbosa 1995, Alexiadou and Anagnostpoulou 1998).

In the control example, the subject is final, hence could in principle be located in the complement or in the matrix clause. Indeed, both options are available to the pronominal subject, as the translations show, but not to the lexical one; the latter can only be the matrix subject.

The explanation for the contrast offered by Szabolcsi and Barbosa is straightforward. The raising sentence (67a) contains no matrix subject; the verb requires none (being unaccusative) and neither does the EPP, as mentioned. The control sentence, however, must contain a matrix subject, because the control verb selects an external argument. This subject, in turn, may be either the final pronoun/DP or a null *pro*. From the matrix subject position, either a pronoun (68a) or a lexical DP (68c) will control PRO. In the embedded subject position, a pronoun can be controlled (68b) but a lexical DP will incur a condition C violation, being bound by the matrix *pro* (68d). This network of assumptions, all independently motivated, explains why unraised subjects are indifferent to the pronoun/DP distinction whereas controlled subjects are sensitive to it (only tolerating pronouns).[18]

(68) a. [[Decidiu [PRO$_i$ ir ao mercado]] só ele$_i$].
b. [*pro*$_i$ [Decidiu [ir ao mercado] só ele$_i$]].
c. [[Decidiu [PRO$_i$ ir ao mercado]] só o João$_i$].
d. * [*pro*$_i$ [Decidiu [ir ao mercado] só o João$_i$]].

Barbosa bolsters the argument by noting a further contrast between raising and control. The argument is based on the well-known fact that negative quantifiers (NQ) cannot be left-dislocated.

(69) A Teresa$_i$/*Nenhuma criança$_i$ escreveu ela$_i$ o poema.
the Teresa/*no child wrote she the poem
'Teresa$_i$/*No child$_i$, she$_i$ wrote the poem.'

As Barbosa observes, this asymmetry is puzzling if the preverbal position is the normal A-position of the subject (and the pronoun is a spelled out trace); it is expected if indeed the preverbal position (in null-subject languages) is reserved for left-dislocated phrases.

Against this background, consider the predictions for raising and control constructions, with a preverbal NQ in the matrix clause coindexed with a postverbal pronoun in the infinitive. In the raising case, the NQ and the pronoun would form an illegitimate left-dislocation dependency, which is expected to be ungrammatical just as it is in the simple sentence (69). In the control case, the NQ would be generated as the external argument in the matrix clause, raised by Ā-movement to a topic position. The embedded subject, a controlled pronoun, would be a variable bound from an A-position; crucially, no direct left-dislocation dependency is formed between the NQ and the pronoun, and the sentence should come out grammatical.

[18] In Section 4.4.2 we discuss backward control, which features embedded lexical subjects. This phenomenon is unattested in the languages under discussion.

(70) a. *Raising*
[$DP_i$ / *$NQ_i$ [$_{TP}$ $V_R$-T [$_{VP}$ $t_V$ [$_{TP}$ $V_{INF}$ [$_{VP}$ $pronoun_i$ . . . ]]]]]

b. *Control*
[$DP_i$ / $NQ_i$ [$_{TP}$ $V_C$-T [$_{VP}$ $t_i$ $t_V$ [$_{TP}$ $V_{INF}$ [$_{VP}$ $pronoun_i$ . . . ]]]]]

The prediction is confirmed: either a referential DP or an NQ can control an overt embedded pronoun, but only a referential DP can be linked to a pronoun in a raising complement. The contrast is all the more striking since it was raising complements that were more tolerant than control ones to overt subjects to begin with; cf. (67a–67b).

(71) a. O hóspede$_i$/*nenhum hóspede$_i$ acabou por fazer *Raising*
the guest/*no guest ended up to.do
**ele**$_i$ o pequeno-almoço.
he the breakfast
'The guest/*No guest turned out to prepare breakfast himself.'

b. O hóspede$_i$/nenhum hóspede$_i$ optará por fazer *Control*
the guest/no guest will.choose up to.do
**ele**$_i$ o pequeno-almoço todos os dias.
he the breakfast every the days
'The guest/No guest will choose to prepare his breakfast himself every day.'

This contrast confirms that the matrix DP is *generated* as an argument of the matrix clause in control but not in raising. Suppose, counterfactually, that controllers were generated in the embedded clause and then raised to the matrix. If the embedded pronoun is a spell out of the trace of that movement in (71b), the same derivation should have licensed an NQ in (71a). If, on the other hand, the matrix NQ is base-generated in the left periphery of the matrix clause, it should bind a *pro* in the external argument position, and the embedded pronoun would be a spelled out trace of that *pro*. The NQ-*pro* dependency should be excluded as an instance of left dislocation and (71b) should have been ungrammatical with an NQ, just like (71a). The implication is that there is no chain relation between the matrix subject and the embedded pronoun in (71b) – neither a direct nor a (*pro*-mediated) indirect one.

**Case preservation/independence**. The final syntactic contrast between raising and control shows up in case-concord languages. In these languages, predicates and floating quantifiers agree with the associated DPs not only in ϕ-features but also in case. As we discuss in Section 4.2 below, visible case-concord provides solid evidence for (i) the existence of PRO and (ii) the case-marking of PRO (see Comrie 1974, Andrews 1976, 1982, 1990, Thráinsson 1979, Sigurðsson 1991, 2002, 2008, Landau 2006, 2008, Bobaljik and Landau 2009).

The point of current interest is that case-concord often reveals that the null subject of a control complement bears a distinct case from its controller. However, the null subject of a raising complement uniformly displays the case of its antecedent, the matrix raisee. This pattern is manifested in full generality in Icelandic, where subjects, including PRO, may bear quirky case. In the control examples (72a–72c), PRO bears quirky accusative, dative or genitive case. Crucially, the controller bears nominative case throughout (data from Sigurðsson 1991, O'Neil 1997: 109).

(72) a. Strákarnir$_i$ vonast til [að PRO$_i$ vanta ekki alla
the.boys.**NOM** hope for to PRO.**ACC** to.lack not all.**ACC**
í skólann].
in the.school
'The boys hope not to be all absent from school.'

b. Strákarnir$_i$ vonast til [að PRO$_i$ leiðast ekki
the.boys.**NOM** hope for to PRO.**DAT** to.be.bored not
öllum í skóla].
all.**DAT** in school
'The boys hope not to be all bored in school.'

c. Strákarnir$_i$ vonast til [að PRO$_i$ verða allra getið
the.boys.**NOM** hope for to PRO.**GEN** be all.**GEN** mentioned
í ræðnnie].
in the.speech
'The boys hope to be all mentioned in the speech.'

Compare raising complements, where the lower case is preserved (matched by) the higher case.

(73) a. Strákana$_i$ virðist [t$_i$ vanta ekki alla í skólann].
the.boys.**ACC** seem to.lack not all.**ACC** in the.school
'The boys seem not to be all absent from school.'

b. Strákunum$_i$ virðist [t$_i$ leiðast ekki öllum í skóla].
the.boys.**DAT** seem to.be.bored not all.**DAT** in school
'The boys seem not to be all bored in school.'

c. Strákanna$_i$ virðist [t$_i$ verða allra getið í ræðnnie].
the.boys.**GEN** seem to.be all.**GEN** mentioned in the.speech
'The boys seem to be all mentioned in the speech.'

Whereas the quirky case assigned by the embedded predicate "percolates up" to a raised subject, it does not to a controller (see also Thráinsson 1986, Sigurðsson 2008). This makes perfect sense if the quirky case is actually *assigned* to the raised subject (prior to raising) in (73), and, as is standard in A-chains (e.g., passive), "overrides" the structural case of the landing site. In (72), however, the lower quirky case is assigned to PRO. The controller and

PRO belonging to different chains, they are under no obligation to share their case any more than a DP and a pronoun it binds are.[19]

The literature occasionally mentions other alleged raising/control contrasts. Rizzi (1982) observed that control infinitivals can be preposed, but raising ones cannot (e.g., *To be a winner, John certainly wants/*seems*); the same contrast is noted by Chomsky (1981: 62) and Jacobson (1992). However, Jacobson observes that many object control verbs strongly resist complement preposing (e.g., *persuade, order*), and we might add a few subject control verbs as well (e.g., *manage, condescend*); see also Martin 1996: 146. In fact, Rosenbaum (1967) already singled out the class of control complements that cannot be preposed and analyzed them as "VP complementation" structures, i.e., clauses directly dominated by VP; see (6). In modern terms, it seems that the whole issue is related to the case properties of the matrix verb and is orthogonal to the raising/control distinction. Other less than perfect contrasts that Jacobson cites (ellipsis/pronominalization of the infinitive) are also amenable to this treatment (see Landau 2000: 87–88 and Asudeh 2005 for critical discussion).

## 1.3 The OC signature

Any analysis of a set of data (linguistic or not) must justify the boundaries of the set. That is, the analysis must pick a natural class of phenomena and guard against the inclusion of "noise," or irrelevant data. Often, delimiting the data set and arguing for or against a particular analysis proceed in parallel and affect each other. Thus, one can argue against a given analysis on the basis that it ignores (and fails to explain) some data that *should* be included in the natural class under investigation; and one can argue just conversely, that some data must be excluded from the natural class *because* they do not follow from one's analysis.

There are no easy ways to settle these concerns, except for careful empirical investigations. In the realm of control, a fundamental issue that raises this kind of methodological questions is the proper demarcation between obligatory and nonobligatory control. That *some* such distinction is needed is universally accepted. Even before the terms OC (obligatory control) and NOC (non-obligatory control) were coined, the earliest studies distinguished between Equi-NP Deletion and Super-Equi NP Deletion (Rosenbaum 1967, Grinder 1970). However, disagreements proliferate once we ask how to draw the line between them. Just as in taxonomical debates within evolutionary biology, much depends on the proper classification of the facts. To illustrate with concrete examples, theories of OC have been long misguided in excluding

[19] In Section 4.2 we will see that case matching between the controller and PRO in OC is, in fact, possible under restricted circumstances. Importantly, it is never mandatory, as it is in raising.

*partial control* from their purview, for it is a genuine subspecies of OC (see Section 5.2). Likewise, certain theoretical debates about the nature of OC, e.g., between GB and LFG, have been marred by taxonomic divergences – entire sets of data that GB classified as OC were reclassified by LFG as NOC.

The goal of the present section is to offer a maximally useful set of criteria for identifying an OC construction, in any given language. The emphasis on crosslinguistic validity will surely result in a more minimal set of OC criteria than has been proposed in the past (mostly on the basis of English alone). As it turns out, several "false" criteria (to which I return in the next section) seriously distort our perception of the universal core of OC. Thus, in choosing to focus on some criteria and discard others, we will be guided by the good old scientific instinct: which version of a theoretical concept offers the most insight into the data under consideration? Which definition of OC allows us to capture the most significant linguistic generalizations?

In what follows I will refer to this definition as *the OC signature*. Constructions that display it are considered OC and those that do not are not (i.e., they either involve no control, or NOC). Note that "controls" below is to be understood pre-theoretically as an antecedence relation.

(74) *The OC signature*
In a control construction [ . . . $X_i$ . . . [$_S$ $PRO_i$ . . . ] . . . ], where X controls the PRO subject of the clause S:
a. The controller(s) X must be (a) co-dependent(s) of S.
b. PRO (or part of it) must be interpreted as a bound variable.

Some comments are in order on how this definition subsumes familiar characterizations of OC (for a review of approaches, see Landau 2000). The controller is neutrally termed X and not a DP, to allow implicit controllers (see Section 5.4). A "dependent" of S is either an argument or an adjunct of S; thus (74a) subsumes both complement OC, where the controller and S are co-arguments, and adjunct OC (to which we return in Chapter 6). (74a) also allows more than a single controller, provided they are both co-dependents (in effect, co-arguments) of S, to include split control (see Section 5.3). The parentheses in (74b) are meant to allow partial control (see Section 5.2).

(74a) is a compact, and probably truer way to exclude three types of configurations from OC: arbitrary control (75a), long-distance control (75b) and non-c-commanding control (75c).

(75) a. * Mary hates [$PRO_{arb}$ to nominate oneself].
b. * $Mary_i$ realized that John hated [$PRO_i$ to nominate herself].
c. * Mary's$_i$ colleagues hated [$PRO_i$ to nominate herself].

In (75a) the controller is an unspecified person or group of people, which do not participate in the matrix event, hence, perforce, are not co-dependents of the

infinitive. Likewise in (75b, 75c), the controller *Mary* is not a co-dependent of the infinitive (clausemateness is necessary for co-dependence). Notice that the "co-dependent" formulation in (74a) is superior to the three separate statements (no arbitrary control, no long-distance control, no non-c-commanding control), not only in being more compact but also in bringing out the lexical aspect of OC: as we will discuss in Section 5.1 in detail, the choice of controller in OC is largely determined by the lexical semantics of the control verb. Hence it is not surprising that the notion of locality relevant to OC will center on that verbs' arguments and adjuncts. This is in no way inconsistent with OC being "syntactically real" as well, as will be amply demonstrated below.

(74a) derives a fourth familiar property of OC (first recognized, to my knowledge, by Morgan (1970)): in ellipsis contexts, PRO in the elided VP must be construed sloppily (and not strictly), that is, its controller must be a local co-dependent of the elided clause and not the controller in the antecedent clause. This is illustrated with VP-ellipsis in (76a) and with Stripping in (76b). The obligatory sloppy reading is indicated by the indices on PRO inside the ellipsis site (marked by strikethrough).

(76) a. $\text{Mary}_i$ expected [$\text{PRO}_i$ to attend the ceremony], and $\text{Sue}_j$ did too
~~expect~~ ~~[$\text{PRO}_{j/*i}$ to attend the ceremony]~~
b. Mary encouraged $\text{Paul}_i$ [$\text{PRO}_i$ to attend the ceremony], but not $\text{David}_j$
~~encourage~~ ~~[$\text{PRO}_{j/*i}$ to attend the ceremony]~~

(74b) is observed in contexts where a bound variable reading and a strict reading produce different truth conditions, as discussed above in (19)–(20). Consider a scenario where Peter, Jane and Roy play some game. In one ending, they disagree on who won the game. In another ending, they all agree it was Peter.

(77) a. Peter claimed that he (Peter) won, Jane claimed that she (Jane) won and Roy claimed that he (Roy) won.
b. Peter, Jane and Roy claimed that Peter won the game.

These two scenarios produce distinct truth conditions for (78a–78b). Specifically, sentence (78a) is false under scenario (77a) and true under (77b). Sentence (78b), on the other hand, is ambiguous; on one of its readings, it is synonymous to (78a), producing falsity in (77a) and truth in (77b). Its other reading, however, is true under scenario (77a) and false under scenario (77b).

(78) a. $\text{Only Peter}_i$ claimed [$\text{PRO}_i$ to be the winner].
b. $\text{Only Peter}_i$ claimed [that $\text{he}_i$ was the winner].

The two relevant readings are represented in (79).

(79) a. Bound variable reading: Peter = Only $x$ [$x$ claimed $x$ is the winner].
b. Strict reading: Peter = Only $x$ [$x$ claimed Peter is the winner].

Property (74b) declares that PRO is unlike pronouns in that in OC contexts, it must be interpreted as a bound variable (whose binder is the controller), whereas normal pronouns normally allow either the bound variable or the strict reading.

So far, I have only considered OC into complements. As is well known, there is also a class of OC adjuncts. Since adjunct control, in general, is a highly complex phenomenon (see Chapter 6), here I restrict attention to clear OC adjuncts. In English, these are represented by final (non-initial) temporal gerunds (including *without*-clauses), as in (80a), and several types of infinitival modifiers, including result clauses (80b), outcome (or telic) clauses (80c), goal clauses (80d) (which are distinct from rationale clauses) and stimulus clauses (80e) (see Huettner 1989 for extensive discussion of these little-discussed adjuncts).

(80) a. $\text{Bill}_i$ called us [before/after/while/without $\text{PRO}_i$ visiting his aunt].
b. $\text{Mary}_i$ grew up [$\text{PRO}_i$ to be a famous actress].
c. The $\text{ship}_i$ sank, [only $\text{PRO}_i$ to be dredged up again].
d. $\text{Max}_i$ works hard [$\text{PRO}_i$ to stay out of jail].
e. $\text{Mary}_i$ smiled [$\text{PRO}_i$ to think what a fool she had been].

These adjuncts possess the OC signature. The controller is necessarily the subject of the clause immediately containing the nonfinite adjunct, in accordance with the co-dependence condition: (81a) shows that arbitrary, long-distance and non-c-commanding control are ruled out. (81b) illustrates that PRO only admits a sloppy reading under ellipsis. This minimal sample represents the general behavior of the adjuncts in (80).[20]

(81) a. $\text{Mary}_i$ thought [that [$\text{our}_j$ son]$_k$ should apologize [after $\text{PRO}_{*i/*j/*arb/k}$ embarrassing *herself/*ourselves/*oneself/himself]].
b. $\text{Mark}_i$ trembled [$\text{PRO}_i$ to hear the results of the vote], and so did $\text{Beth}_j$ ~~tremble [$\text{PRO}_{j/*i}$ to hear the results of the vote]~~.

To test for the bound-variable reading of PRO, consider the following two scenarios.

[20] It is almost an axiom of the field that adjunct control is subject-oriented by necessity, but there are some constructions that seem to challenge this claim. "Subject purpose clauses" are controlled by the matrix theme (i) and "object purpose clauses" may be controlled by the matrix goal/benefactive (ii) (Faraci 1974, Nishigauchi 1984, Jones 1991); "exchange clauses" are controlled by the matrix recipient/benefactive (iii) (Huettner 1989); and "reason clauses" are controlled by the matrix object (iv). There is no straightforward configurational account of the control asymmetry. Thus, standard constituency tests locate both the adjuncts in (80b, 80d, 80e) and those in (i)–(iv) under VP. Explaining object-controlled adjuncts is still an open problem.

i. We bought a $\text{dog}_i$ to [$\text{PRO}_i$ watch the house].
ii. We bought $\text{Mary}_i$ a dog [$\text{PRO}_i$ to play with].
iii. I paid $\text{Mary}_i$ ten dollars [$\text{PRO}_i$ to stand on her head].
iv. She blamed/envied $\text{John}_i$ [for $\text{PRO}_i$ drawing all the attention to himself].

(82) a. Peter laughs after he (Peter) tells jokes, Jane laughs after she (Jane) tells jokes, and Roy laughs after he (Roy) tells jokes.
b. Peter, Jane and Roy laugh after Peter tells jokes.

Sentence (83a) is false in context (82a) and true in context (82b). Sentence (83b) is ambiguous: on the bound-variable reading of *he*, the sentence is synonymous with (83a). On the strict reading, it is true in context (82a) and false in context (82b).

(83) a. Only $\text{Peter}_i$ laughs [after $\text{PRO}_i$ telling jokes].
b. Only $\text{Peter}_i$ laughs [after $\text{he}_i$ tells jokes].

The two relevant readings are represented in (84).

(84) a. Bound variable reading: Peter = Only $x$ [$x$ laughs after $x$ tells jokes].
b. Strict reading: Peter = Only $x$ [$x$ laughs after Peter tells jokes].

Thus, unlike pronouns, PRO in adjuncts of the types in (80) is necessarily a bound variable, confirming the OC status of the construction.

There is another interpretive property which is often presented as part of the OC signature: The *de se* reading of PRO (Castañeda 1967, Chierchia 1990, Higginbotham 1992, Hornstein 1999, 2003, Landau 2000). However, this is a misconception. Adjunct OC does not require *de se* readings, and even complement OC sometimes does not, as we shall shortly see.

The *de se–de re* distinction arises in situations where a person is unaware of (an aspect of) his or her identity. For example, looking at your reflection in the mirror, or listening to your voice in a recording, without identifying yourself. *De re* refers to a belief that holds true of an individual, regardless of his beliefs; *de se* refers to a belief that holds true of the individual's self-perception. For example, imagine that John's computer has been hacked, and some secret files have been copied from it by a business competitor. John's company holds an urgent meeting to decide on the necessary measures. John has no idea that his own computer was the one that was hacked, but he is determined to punish any careless workers who failed to protect their computers against malicious attacks. In that scenario, (85a) is probably false but (85b) is true.

| | | |
|---|---|---|
| (85) a. | $\text{John}_i$ insists on [$\text{PRO}_i$ being punished]. | only *de se* – False |
| b. | $\text{John}_i$ insists [that $\text{he}_i$ be punished]. | *de se* – False; *de re* – True |
| c. | Every $\text{worker}_i$ insists [that $\text{he}_i$ be punished]. | *de se* – False; *de re* – True |

Importantly, the *de se* reading is not a side-effect of variable binding. Even in a situation where everybody's computers have been hacked without their knowledge, (85c) would still admit a true *de re* reading.[21]

[21] This point was made by Landau (2000, 2003) against the movement theory of control, where *de se* readings are attributed to the semantic representation of A-chains, which involves variable

One might suppose that the bound-variable *de se* interpretation intrinsically characterizes PRO vs. pronouns, but in fact it is better to view it as characterizing OC (or more accurately, most instances of complement OC). Thus, languages with controlled pronouns and reflexives, such as Korean, impose these interpretations even on such overt subjects in appropriate OC contexts (see Section 4.4.1).

Although rarely tested, PRO in OC adjuncts is not restricted to a *de se* reading. Thus, in the same context that precedes (85), (86a) can be truthfully uttered. Notice that PRO must be interpreted *de re*, since John is unaware of the fact that his own computer (due to his own carelessness) has been hacked. Similarly, in the worn-out scenario of the amnesiac war hero ("the unfortunate") who receives a medal for exploits erased from his memory, (86b) could be true (e.g., the unfortunate likes watching medal-awarding ceremonies) even when the unfortunate is not aware of the fact that he himself got the medal.

(86) a. John$_i$ was furious mad [despite PRO$_i$ being the careless worker himself].
b. The unfortunate [[thought [that the ceremony was boring]] [before PRO$_i$ getting a medal]].

The reason why PRO in OC adjuncts may be *de re* need not concern us here. Possibly, it is related to the fact that the adjunct is interpreted outside the intensional scope of the matrix verb. What is important is that obligatory *de se* fails to hold in adjunct OC. Obviously, one might take this as an argument *against* classifying adjunct control (as in (80)) under OC in the first place. I am not wholly unsympathetic to this position, since, as we will see in Section 6.2, adjunct OC displays other contrasts with complement OC (ultimately related to the fact that the former, but not the latter, reduces to predication). However, not wishing to depart too much from standard conceptions of OC, I chose to unify both types on pains of their identical behavior with respect to the criteria (74a–74b). This is another instance of the "taxonomic" concerns that were raised at the outset.

Perhaps more damaging to the view that OC implies an obligatory *de se* reading, and less widely known, is the fact that some OC complements (in certain contexts) allow *de re* readings (Safir 2010, from which examples (87a–87b)/(88a, 88c–88d) are drawn; see also Sundaresan 2010). The first class of cases involves inanimate controllers; *de se* is excluded, obviously, since awareness is. It is easy to verify that these are genuine control constructions, and not raising constructions.

binding (Hornstein 1999, 2003). For semantic accounts of the *de se* reading of PRO in OC, see Chierchia 1990, Higginbotham 1992, Schlenkar 2003, Anand 2006, Stephenson 2010 and Hornstein and Pietroski 2010.

(87) a. This key$_i$ will serve/do [PRO$_i$ to open the door].
b. The accident$_i$ is responsible [for PRO$_i$ causing the ship to sink].
c. The transmission problem forced the car$_i$ [PRO$_i$ to stop].

Even human controllers need not entertain a *de se* belief. Indeed, this is typically so for the goal argument of communication verbs (88a–88b), whose mental state is not implicated, but also for some subject controllers (88c–88d).

(88) a. Mavis screamed at/mumbled to Toby$_i$ [PRO$_i$ to batten the hatches] (but he never heard her).
b. The head of ceremony signalled to the amnesiac$_i$ [PRO$_i$ to leave the stage].
c. John$_i$ managed [PRO$_i$ to avoid the draft] (because he spent that decade in a coma).
d. Mary$_i$ neglected [PRO$_i$ to send the payment].

It seems that an obligatory *de se* reading is a lexical property of many OC verbs (i.e., those implicating the controller's mental state), but not all of them. Thus, it cannot be taken to be criterial for OC in the sense that (74a–74b) are. This observation undermines theories of OC, semantic and syntactic alike, which derive both the very effect of OC and the *de se* interpretation from a common source (e.g., Hornstein and Pietroski 2010).

Finally, note that (74) sets minimal boundary conditions on OC, without specifying further restrictions that may apply in specific OC constructions. As hinted, it makes no comment on differences between complement OC and adjunct OC, such as the tolerance of the former, but not of the latter, to implicit, partial and split control (see Sections 5.2–5.4). Nor does it provide means to select the controller from several matrix arguments on the basis of configurational or semantic properties (see Section 5.1). In short, (74) is a heuristics, not a theory.

In Chapter 7 we turn to examine NOC configurations and demonstrate their exemption from the criteria in (74).

## 1.4 Bogus criteria for OC or NOC

Classical and also more recent accounts of control assume that more criteria distinguish OC from NOC than (74a–74b). As discussed above, this is partly due to different perceptions of how uniform the OC category should be. However, there are also empirical issues. Some of the criteria were proposed on the basis of one or two languages, and fail to extend to others. Other criteria are more theory-bound and lose their force under alternative theories. In this section I consider a few potential OC/NOC criteria and point out their flaws.

Throughout the 1980s it was commonly held that the controller in OC must be a unique overt matrix argument.[22] This view excluded from OC any constructions that allowed an arbitrary PRO (89a–89b), control shift (between subject and object, (89c)) or split control (89d).

(89) a. The policeman shouted [$PRO_{arb}$ to evacuate the building].
b. Fred wondered [where $PRO_{arb}$ to hide oneself].
c. $Tommy_i$ begged his $mother_j$ [$PRO_{i/j}$ to stand next to $her_j$/$him_i$].
d. $Chris_i$ proposed to his $officemate_j$ [$PRO_{i+j}$ to introduce themselves to the new boss].

However, there are good reasons to retain all these examples under OC. (89a) illustrates a common variety of OC, where the controller – the goal argument of *shout* – is left implicit. The arbitrary reading of PRO is simply inherited from the controller, which is both obligatory and local (see Section 5.4). (89b) illustrates control into interrogative complements, which is commonly viewed as NOC. However, as demonstrated in Landau 2000: 39–42, such complements display partial control, which is a subtype of genuine OC (see Section 5.2). What (89a–89b) jointly imply is that the *oneself*-test reflects a certain reading of PRO, but does not diagnose NOC.

In the same vein, (89c–89d) behave like OC constructions in all other respects: None of the (variable) controllers can be in a higher clause (or deictic), and PRO must be construed as a *de se* bound variable. It is notable that control shift and split control are subject to much crosslinguistic and idiolectal variation (see Sections 5.1.2, 5.3), which is partly predicted from semantics and partly idiosyncratic. A theory that recognizes the role of such factors in the choice of controller has no problem including them under OC.

If any of the complements in (89) had truly allowed NOC, they should have allowed long-distance control *across* the specified local controller – but none of them does.

(90) a. * $We_i$ heard that the policeman shouted to Mary [$PRO_i$ to run for our lives].
b. * $Mary_i$ knew that Fred wondered [where $PRO_i$ to hide herself].
c. * $I_i$ thought that Tommy begged his mother [$PRO_i$ to allow myself in].
d. * $Lisa_i$ expected $Chris_i$ to propose to his officemate [$PRO_i$ to introduce herself to the new boss].

Bound variable and *de se* readings are obligatory as well; we illustrate with two examples only.

[22] See Williams 1980, Bresnan 1982, Bouchard 1984, Koster 1984, Chierchia 1984, Lebeaux 1984. The same position has been advanced in the movement theory of control (Hornstein 1999, 2003 and subsequent work).

(91) a. The policeman only shouted to MARY to leave the building.
[= Mary is the only x s.t. the policeman shouted to x: "Leave the building!"; ≠ Mary is the only x s.t. the policeman shouted to x: "Mary should leave the building!"]

b. The unfortunate$_i$ wondered [what PRO$_i$ to say in the ceremony].
[False in the context provided for (86b)].

VP-ellipsis tests (yielding only sloppy readings) converge on the same conclusion: all the matrix verbs in (90) induce OC in their complements. As a matter of fact, the conclusion can be put much more strongly – control into a complement clause is *always* obligatory. This striking generalization, and its origin, are discussed in the next section.

Two more potential confusions should be cleared away. Some early analyses of OC (e.g., Williams 1980, Bresnan 1982, Chierchia 1984), when demarcating OC from NOC, heavily relied on the availability of *for*-complements in English. Thus, *hope* and *try* were assigned to different types because of the following contrast.

(92) a. Mary hoped [(for Bill) to be elected]. *alleged NOC*
b. Mary tried [(*for Bill)] to be elected]. *OC*

However, this criterion is unreliable for several reasons (see Wyngaerd 1994: 246–255 for a detailed critique). First, it is crosslinguistically suspect; most languages disallow lexical subjects in any nonfinite complement. The criterion would seem to imply that unlike English *want*, its analogues in Spanish (*querer*) or Hebrew (*raca*) are OC verbs, seriously undermining the idea that the control behavior of a verb is fully predictable from its meaning. Second, classifying *want* (*hope, need, beg* etc.) as NOC obscures its fundamental similarity to *try* (*convince, dare, remember*) etc. – namely, the fact that *when* the embedded subject is null, it is obligatorily controlled by some matrix argument. The *for*-complement test should more aptly be termed "obligatory nullness" criterion rather than "obligatory control" criterion. Third, even within English (as noted in Manzini 1983) the criterion is unstable. While (93a) would classify *decide* as a NOC verb for Williams (or "anaphoric control" for Bresnan), (93b) would classify it as an OC (or "functional control") verb for both.

(93) a. It was decided to shave oneself.
b. John decided (*for Bill) to shave himself.

As pointed out in Chomsky and Lasnik 1977 and Pesetsky 1991, the acceptability of *for*-complements in English is subject to considerable cross-speaker variation. At the same time, whether or not a null subject in a verb's complement

is obligatorily controlled seems to be invariant across speakers. This strongly suggests that *for*-complementation is not a genuine OC criterion.[23]

The last bogus criterion for OC has to do with the size of the complement. According to some theories, full CPs block OC by creating some barrier between the matrix verb and PRO; thus OC is only possible into bare IPs/TPs (Bouchard 1984, Koster 1984, Hornstein and Lightfoot 1987). Even putting aside the contentious case of *wh*-infinitives (which were argued above to fall under OC), there is much crosslinguistic evidence against this position. Overt complementizers (presumably heading a CP projection) readily head OC complements; see (56)–(57).

Petter (1998: 60, 64) argues that the presence of the complementizer *om* in Dutch is orthogonal to the OC/NOC distinction. Some verbs that do not select *om*-complements, and therefore predicted by Koster (1984) to fall under OC, allow variable control (94a) – a NOC property for Koster; while other verbs that do select *om*-complements nevertheless force a sloppy reading for PRO under ellipsis (94b) – an OC property. A CP layer does not seem to affect the OC status of the complement (although a DP layer might do so; see Section 1.6).

(94) a. Jan$_i$ zei (tegen) Piet$_j$ [(*om) PRO$_{i/j}$ direct te vertekken].
Jan said (to) Piet (*for) immediately to leave
'Jan said to Piet that he (Jan) would leave immediately.'
'Jan said to Piet that he (Piet) should leave immediately.'

b. Jan beloofde Marie [om PRO meteen naar huis te komen],
Jan promised Marie for at.once to house to come,
en dat deed Bill ook.
and that did Bill too
'Jan promised Marie to come home at once, and so did Bill.' *sloppy only*

For a detailed critique of Koster's distinction between OC and NOC complements in Dutch, see Wyngaerd 1994: 268–275.

In conclusion, neither the implicitness of a controller or its flexible choice, nor the overtness of a complementizer or a possible embedded subject detract from the OC status of the complement. All the evidence suggests that these various

[23] This is not to imply that the test is linguistically uninteresting. As noted long ago by Bresnan (1972), only irrealis complements select *for*-complements (though the reverse is not true, as (93b) shows), and this property may be syntactically significant (Pesetsky and Torrego 2001). Interestingly, Chomsky and Lasnik (1977) also take the split between *for*-taking verbs and others (as in (92)) to indicate an underlying contrast, although not between OC and NOC. They claim that verbs like *try*, *promise*, *persuade* etc. are subject to a rule of obligatory control, which imposes an embedded controlled PRO subject. By contrast, verbs like *want*, *prefer*, *hope* etc. uniformly select a *for*-infinitive; when the subject of that infinitive is a reflexive, the marginal result (e.g., ? *We want very much for ourselves to win*) can be simplified by "Reflexive Deletion," followed by *for*-deletion (to conform with the *[*for-to*] filter). This proposal prefigures the binding theory of OC (see Section 2.2).

options, which are subject to considerable variation across languages, speakers and specific control verbs, distinguish among different members *within* the OC category.

## 1.5 Configurations of OC and NOC

Having isolated the core properties of OC from peripheral and apparent ones, we are in a position to tackle the next question: what determines the control status of a clause? In particular, what syntactic factors predict whether a given clause, in a given configuration, will display OC or NOC? We will see below that there are three relevant syntactic determinants to the OC/NOC distinction.

(95) *Syntactic determinants of OC vs. NOC*
a. The *position* of the clause (complement, subject or adjunct).
b. The *category* of the clause (CP vs. NP/DP).
c. The *finiteness* of the clause (its tense/agreement specifications).

In this section I focus on (95a). The next section addresses (95b) and Section 4.1 discusses the complex interaction of finiteness with control, (95c).

There is nearly unanimous agreement among scholars of control that the complement/non-complement distinction directly affects the type of control. That is, complement clauses systematically differ from both subject and adjunct clauses. The full picture of adjunct control is actually quite complex, there being many different kinds of adjuncts; I defer discussion of this topic to Chapter 6. Presently I will restrict attention to *argumental* extraposed (adjoined) clauses. Comparison of these clauses with subject and complement clauses, which are also argumental, offers a clean way to isolate the pure effects of structure on control.

These effects can be summarized in the following simple generalization (see Manzini 1983, Landau 2001).

(96) *Configurational effects on control*
Complement clauses fall under OC; subject and adjoined (extraposed) clauses fall under NOC.

The following minimal triplet data illustrates this asymmetry. Note that the subject clause in (97b) and the extraposed clause in (97c) display NOC (here realized as long-distance control), whereas the complement clause in (97a) displays OC.

(97) a. We$_i$ thought that John would help Mary$_j$ [PRO$_{j/*i}$ to expose herself/ *ourselves]
b. We$_i$ thought that [[PRO$_{j/i}$ to expose herself/ourselves]] would help Mary$_j$.
c. We$_i$ thought that it would help Mary$_j$ [PRO$_{j/i}$ to expose herself/ourselves].

That subject clauses are more liberal in control than complement clauses has been known at least since Grinder's (1970, 1971) studies of Super-Equi. For example, subject gerunds allow split control from different clauses, as (98a) shows (Grinder 1970), or control from two clauses below (98b) (from Richardson 1986). In Chapter 7 we return to examine the special properties of NOC.

(98) a. [That [$PRO_{1+2}$ covering themselves with mud] disturbed $Spiro_1$] amused $Dick_2$.
b. [$PRO_1$ storming out of the room that way after losing the game] convinced everyone [that $John_1$ is very immature].

A principled distinction between complement and subject clauses was first proposed by Williams (1980), although he incorrectly predicted OC in (97c). Manzini 1983 was the first study to subsume both (97b–97c) under NOC. The complement-subject distinction, and its correlation with the OC-NOC distinction, have been widely recognized and analyzed (Lebeaux 1984, Chierchia and Jacobson 1986, Huang 1989, Sag and Pollard 1991, Manzini and Roussou 2000). However, all of these studies incorrectly predict OC in extraposition. On the other hand, Bresnan 1982, Manzini 1983, Bouchard 1984, 1985 and Williams 1992 classify (97c) under NOC (see Landau 2000: 122–128 for historical discussion).

Part of the disagreement can be traced to a finer distinction between two contexts of extraposition that contrast in their control behavior, a distinction first observed in Landau (2000, 2001). It turns out that when the local DP is an experiencer object of a psych verb, it cannot be skipped, whereas a theme or goal argument can. Thus, psych verbs in extraposition impose OC and non-psych verbs allow NOC (although a local controller is preferred for processing reasons). The contrast is neutralized in subject clauses, which allow NOC regardless of the type of the matrix predicate.

(99) a. $Mary_i$ thought that it pleased $John_j$ [$PRO_{*i/j}$ to speak $his_j$ / *$her_i$ mind].
b. $Mary_i$ thought that it helped $John_j$ [$PRO_{i/j}$ to speak $his_j$ / $her_i$ mind].
c. $Mary_i$ thought that [$PRO_{i/j}$ to speak his / her mind] would please $John_j$.
d. $Mary_i$ thought that [$PRO_{i/j}$ to speak his / her mind] would help $John_j$.

The contrast holds in other languages as well, e.g. Swedish.[24]

(100) a. Barnen förstod att det hjälpte/*gladde John att vara snälla.
the.children understood that it helped/*pleased John to be nice (pl.)
'The children understood that it helped/*pleased John to be nice (pl.).'
b. Barnen förstod att a vara snälla gladde/hjälpte John.
the.children understood that to be nice (pl.) pleased/helped John
'The children understood that to be nice (pl.) pleased/helped John.'

[24] Stiebels (2007) argues that psych predicates impose OC into subject clauses in German. I believe this to be a preference at most.

Landau (2001) argued that previous accounts of Super-Equi failed to capture the sensitivity of control to the psych/non-psych character of the predicate selecting the extraposed clause, thus predicting either uniform OC or uniform NOC. The different mapping of arguments of the two types of predicates explains the contrast. Since complement clauses must be right-peripheral to the VP (a prosodic requirement), they must be extraposed whenever generated as VP-specifiers. Landau assumed that the causer infinitive is generated as a complement below the experiencer in (99a) but as a specifier above the theme in (99b). Thus, extraposition is only possible in the latter case (being unmotivated in the former), producing NOC.

This account is modified in Landau 2010b, where eventive psych verbs are mapped just like non-psych verbs to the syntax – causer above experiencer. Hence, extraposition applies equally to all causative constructions, psych-verbs included. The reason why extraposition does not yield NOC with psych-verbs is that the experiencer itself is assumed to undergo LF-raising to the subject position, thus gaining scope even above the extraposed clause.

The link between extraposition and NOC is corroborated by extraction asymmetries. Given that arbitrary or long-distance control is contingent on extraposition, and extraposed clauses are (weak) islands, NOC effects should go hand in hand with island effects.

(101) a. It would be useful to $\text{Bill}_i$ [$\text{PRO}_i$ to talk about $\text{himself}_i$ more modestly].
b. $\text{How}_j$ would it be useful to $\text{Bill}_i$ [$\text{PRO}_i$ to talk about $\text{himself}_1$ $t_j$?]
c. It would be useful to $\text{Bill}_i$ [$\text{PRO}_{arb}$ to talk to $\text{him}_i$ more gently].
d. * $\text{How}_j$ would it be useful to $\text{Bill}_i$ [$\text{PRO}_{arb}$ to talk to $\text{him}_i$ $t_j$]?

To understand this pattern we must appeal to the copy theory of movement. Extraposition affects the PF position of the clause but may leave its LF position internal to the VP. Local control in (101b) is consistent with purely phonological extraposition; the VP-internal position of the clause may feed both control and extraction. Arbitrary control in (101d) necessitates semantic (along with phonological) extraposition; the domain of extraction is therefore an island.[25]

So far we have not said anything about the theoretical account of (96): why are complement (or VP-internal) clauses subject to OC and subject/extraposed

[25] Wyngaerd (1994: 161) observes the following minimal pair.

i. * $\text{Kathleen}_i$ claims that it would be enjoyable for Bill [$\text{PRO}_i$ to hold her breath for days at a time].
ii. $\text{Kathleen}_i$ claims that it would be too enjoyable for Bill [$\text{PRO}_i$ to hold her breath for days at a time].

(i) is on a par with (99a) but (ii) is unexpectedly fine, apparently allowing long-distance control by *Kathleen* across a psych predicate. In fact, as Wyngaerd shows, the controller in (ii) is not *Kathleen* but an implicit argument of the intensifier *too*, for which *Kathleen* provides a possible antecedent. Thus, control in (ii) is local, despite appearances. For further discussion, see example (340) below.

clauses are not? The different approaches to this problem will be discussed in the theoretical survey of control theories (Chapter 2). The general intuition, however, will be the same: complement clauses are more transparent to the mechanism underlying OC – be it predication, binding, agreement or movement – than non-complement clauses.

Before concluding this section, let me point out that the validity of (96) has been challenged from both ends. First, quite a few scholars proposed that NOC into complements is possible; I turn to these cases in the next section. Conversely, OC into subject clauses was also countenanced in Chierchia 1984, Chierchia and Jacobson 1986 and Jackendoff and Culicover 2003. The challenging examples are of the following type.

(102) a. $\text{John}_j$ said that [$\text{PRO}_{i/*j/*arb}$ making a fool of herself/*himself/*oneself] was rude of $\text{Mary}_i$.
b. $\text{Mary}_j$ thought that [$\text{PRO}_{i/*j/*arb}$ solving the problem by himself/*herself/*oneself] would be easy/difficult for $\text{Peter}_i$.

The class of predicates that forces OC into their subject is in fact well-defined. Besides *easy*, *tough*, *hard* and *difficult*, these are all evaluative predicates that optionally select an *of*-PP (*rude of*, *smart of*, *generous of*, etc . . . ). These predicates possess a unique argument structure and display a systematic diathesis, as discussed in Stowell 1991, Bennis 2000, 2004 and Landau 2009 (*John was rude/That was rude of John*). The special status of the *of*-PP, a "demoted" external argument of sorts, may underlie the apparent OC in (102). In other words, one could argue that OC is not a syntactic feature (102) but rather a semantic effect; a NOC interpretation would simply be anomalous. Supportive of this view is the fact that non-local control in (102) remains bad even when the null subject of the gerund is replaced by an overt pronoun, or indeed, when the gerund is replaced by a finite clause.

(103) a. * $\text{John}_j$ said that [him/his making a fool of himself] was rude of Mary.
b. * Mary thought that [her solving the problem by herself] would be easy/difficult for Peter.
c. * That John made a fool of himself was rude of / easy for Mary.

This PRO-pronoun parallelism is in no way characteristic of OC clauses (cf., *$\text{John}_i$ wanted [$\text{PRO}_i$ /$\text{him}_{*i}$ to win]*), nor is the nonfinite-finite parallelism (*$\text{John}_j$ convinced $\text{Mary}_i$ [$\text{PRO}_{i/*j}$ to tell the truth]* vs. *$\text{John}_i$ convinced Mary that $\text{he}_i$ would tell the truth*). For Chierchia and Jacobson, OC in (102a) is achieved via a lexical entailment associated with *rude of*. This entailment is based on the assumption that the gerund selected by *rude of* denotes a property. However, (103a) shows that the relevant entailment holds even when *rude of* selects a propositional gerund (or even a DP; e.g., **Those comments by John were rude of Mary*). I conclude that the facts in (102), although interesting in their own right, do not warrant a wholesale abandoning of (96).

A different sort of challenge to (96) was raised in Arka and Simpson's (1998, 2008) study of the interaction of voice alternations and control in Balinese. In this language, the canonical mapping of transitive verbs in the active voice is reversed in the objective voice (OV): the theme/patient is mapped to subject and the agent is mapped to object ("term-complement"). Arka and Simpson (A&S) argue that the fronted theme in OV is a genuine subject while the postverbal agent is a genuine term, not a demoted PP (as in passive). What is relevant in the present context is that standard OC verbs participate in this alternation, and that the OC "link" is not broken in the OV.

(104) a. Tiang$_i$ negarang [PRO$_i$ naar ubad ento].
I AV.try eat medicine that
'I tried to take that medicine.'

b. [PRO$_i$ naar ubad ento] tegarang tiang.
AV.eat medicine that OV.try I
'Taking that medicine is what I tried.'

A&S, working within LFG, argue that both (104a–104b) display the hallmarks of functional control (see Section 2.3). This is a problem for the theory of Bresnan (1982), where functionally controlled clauses are either complements (XCOMP) or adjuncts (XADJ), never subjects, which are closed functions (COMP). A&S' solution is to locate control not in functional structure but in a level of "syntacticized argument structure."[26] From the present perspective it is important to ask whether (104b) represents a serious flaw in the generalization that subject clauses do not display OC.

In fact, OC into subject clauses can be observed even in English whenever the clause is derived from an object position; i.e., in passive. Since infinitives do not easily passivize, this can only be seen with gerunds.

(105) a. [PRO$_i$ robbing the jewels] was attempted twice (by Bill$_i$).
b. [PRO$_i$ eating junkfood] should be avoided (by anyone$_i$ who is health conscious).

These cases are consistent with (96) on the natural view that control between the external argument and PRO is established prior to the fronting of the clause containing PRO. At this earlier stage, the clause is still in a complement position, hence falls under OC (the controller could be implicit – see Section 5.4). This analysis can be extended to the Balinese example (104b) if the fronted theme in the objective voice is derived from a position lower than the agent. Essentially,

[26] Alongside OV, Balinese has passive, in which the agent is demoted to oblique PP. A&S claim that unlike the term complement agent in (104b), this oblique PP cannot control, in line with LFG's explanation of "Visser's generalization" (e.g., **It was tried by John to take the medicine*). The problem is that Visser's generalization is massively disconfirmed with impersonal passives in other languages, and the term-oblique distinction does not reliably correlate with other OC characteristics; see Sections 2.3, 5.4.1, and Landau 2000: 31–33.

any analysis with this property can accommodate the connectivity effect of OC into the subject.

Indeed, a number of approaches to voice marking in Austronesian languages have this property. Some posit that the deep object undergoes A-movement across the deep subject (Guilfoyle, Hung and Travis 1992, Travis 1999, Rackowski and Richards 2005), others posit Ā-movement (Richards 2000, Pearson 2005); all these studies have indicated that the fronted theme reconstructs to a position lower than the agent for binding purposes. It is therefore quite plausible to extend any one of these accounts to the OC data (104b)–(105), thus removing this potential challenge to the distributional law in (96).

## 1.6 Are there nonfinite NOC complements?

Let us turn to some potential challenges to the claim that complement clauses always display OC.[27] Examining such cases from several languages, a generalization emerges: nonfinite NOC complements are always "nominalized." That is, they are dominated by a DP node, which is either morphologically visible or not. The DP layer intervening between the matrix predicate and the complement TP/CP disrupts the OC dependency – plausibly, due to some locality constraint on the syntactic operation establishing OC – giving rise to NOC.

As a relevant example, consider the following minimal pair in Japanese (from Fujii 2006). The verb *kessinsu(ru)* "decide" selects an OC complement, blocking long-distance control by the plural matrix subject across the intermediate (local) singular subject (106a). In contrast, the verb *keikakusu(ru)* "plan" selects a NC complement, allowing long-distance control (106b).

(106) a. * Karera$_i$-wa [kantoku-ga [PRO$_i$ otagi-o
they-TOP director-NOM each.other.ACC
naguri-a-u-koto]-o kessinsita-to] omotta
hit.RECIP.PRS.*koto*-ACC decided-C thought
'They thought that the director had decided to hit each other.'

b. Karera$_i$-wa [kantoku-ga [pro$_i$ otagi-o naguri-a-u-koto]-o
they-TOP director-NOM each.other.ACC hit.RECIP.PRS.*koto*-ACC
keikakusi-tei-ru-to] omotta
plan-ASP-PRS-C thought
'They thought that the director was planning to hit each other.'

Although the surface form of these examples differ only in the choice of the intermediate verb, Fujii argues that they involve different structures. The

[27] I restrict attention here to nonfinite complements. In Section 4.1.2 I revisit the notion of finiteness that is relevant to control and discuss situations where "no-control" complements are licensed by finiteness ingredients rather than by an enveloping NP projection. See also Section 5.6 for a general discussion of control in (non-clausal) DPs.

particle *koto* is categorially ambiguous between C and N. The verb *decide* selects a CP, which is transparent to OC. The verb *plan* selects an NP, which is opaque to OC. As Fujii shows, this ambiguity correlates with other contrasts between the two types of complements (e.g., passivizability).

Other instances of apparent NOC in complements may be amenable to the same treatment. English gerunds present a particularly complex picture. Some gerundive complements clearly display OC (e.g., following *begin*, *practice*), but others, typically selected by verbs of communication or thought, display NOC, as the following examples from Sag and Pollard 1991 illustrate.

(107) a. Kim discussed perjuring themselves with Sandy.
b. Mary thought that John might be willing to discuss getting herself a new car.
c. Kim and Sandy consider stuffing oneself with nachos to be offensive.

Notoriously, gerunds are categorially ambiguous between NPs and IPs. If the gerunds in (107) are nominal, their NOC behavior would be expected, as Fujii (2006: 78, fn. 19) suggests. This would also explain the striking fact that nonfinite NC complements in English are always gerundive and never infinitival.[28] Note, though, that parallel constructions in other languages may well exploit the infinitival form (Chierchia 1984: 303).

(108) Il commissario ha denunciato vigorosamente prendre tangenti
the commissioner has denounced vigorously to.accept bribes
per appalti pubblici.
for contracts public
'The commissioner denounced vigorously accepting bribes for public contracts.'

[28] The roots of this approach to NOC in gerunds can be traced to Chomsky (1955: 251). Mohanan (1985) claimed that gerundive complements disallow long-distance control. Jackendoff and Culicover (2003) argued that they also disallow speaker/hearer control, and assigned them to an "intermediate" type (which they label "nearly free control"), distinct from NOC. This position is dubious in light of the examples in (107). Pires (2007) explicitly rejects the NP analysis of gerunds, and claims that as complements with null subjects they uniformly force OC. However, he only considered desiderative verbs (e.g., *prefer*), failing to take into account communication and cognitive verbs (*discuss*, *imagine*, *disapprove of* etc.). In fact, even a "strong" OC verb like *try* allows NOC into its gerundive complement under special circumstances. Consider the following example from Sag and Pollard 1991: fn. 40.

i. Mary has been working regularly with that disabled boy to help him improve his motor skills. For the past few weeks she's had him playing catch with a beachball and putting his own pants on, and next week she's planning **to try tying his shoes**.

Notice that the subject of *tying* is controlled by the discourse antecedent *that disabled boy* and not by the local subject of *try*, a PRO coindexed with *Mary*. Tellingly, this reading is lost if we replace *tying* with *to tie*.

The NP (or DP) analysis seems particularly appropriate for complements of *entail*, *require*, *involve*, *beat* and *make*, which also display NOC (Lebeaux 1984, Jackendoff and Culicover 2003). As Lebeaux observed, the "necessity" predicates impose a "linked reference" reading in (109c) when occurring with both a subject and an object gerund, suggesting that even $PRO_{arb}$ is sometimes a locally bound variable.

(109) a. Jeff thinks that this outcome requires/entails/beats [PRO undressing himself/oneself/myself/ourselves in public].
b. Jeff makes [PRO undressing himself/oneself/myself/ourselves in public] almost attractive.
c. [$PRO_{arb}$ making a large profit] requires [$PRO_{arb}$ exploiting the tenants]. (the two $PRO_{arb}$ co-vary)

A final context where gerundive complements appear to allow NOC is within nominalizations headed by monadic nouns like *importance*, *significance*, *possibility*, *advantage* (Sichel 2010). Notice that PRO may pick either a local controller (the benefactive adjunct), a long-distance one or arbitrary reference in (110a). That the gerund is a complement is indicated by its obligatoriness (110b).

(110) a. Mary realizes [the significance/importance of [PRO behaving himself/herself/oneself] for John].
b. * Mary realizes the significance/importance.

Alternatively, NOC in (110a) may be related to the extra level of embedding contributed by the preposition *of*. The lack of certainty as to the precise mapping of arguments within nominalizations makes it difficult to conclude whether this class of examples constitute a genuine challenge to (96).

Other apparent instances of NOC complements, in particular infinitival ones, turn out to fall under OC upon closer scrutiny. One class of cases, already mentioned in Section 1.4, involves communication verbs, whose complements appear to allow arbitrary or long-distance control, and indeed were classified by some scholars under NOC (see Bresnan 1982, Bouchard 1984, Huang 1989, Sag and Pollard 1991).

(111) a. John said/shouted to behave oneself.
b. Mary saw that John gestured/signaled to position herself further to the left.

However, a long tradition of research has shown that these (and related) cases exhibit OC by an implicit controller (Kimball 1971, Epstein 1984, Koster 1984, Comrie 1984, Rizzi 1986a, Roeper 1987, Landau 2000: ch. 5); see Section 5.4 for further discussion. Once the goal argument of the control verb is overtly expressed, it cannot be "bypassed."

(112) a. * John said/shouted to Mary to behave oneself.
b. * Mary saw that John gestured/signaled to us to position herself further to the left.

This clearly indicates that the actual controller in (111) is the implicit goal argument of *say/shout/gesture/signal*. In (111a) this argument is arbitrary in reference, transmitting this interpretation to the PRO it controls; in (111b) it is coreferent with the matrix subject *Mary*, creating the illusion of long-distance control. None of the NOC treatments of (111) can explain the "emergence" of locality in (112).

Indeed, these treatments suffer from other weaknesses. Bouchard (1984) attributes the alleged NOC in (111) to the fact that all the matrix predicates are non-bridge verbs. As such, they resist S'-deletion in their complements, which is necessary for OC (only governed PRO, for Bouchard, is anaphoric and requires a local antecedent). The problem is that *say* is actually a bridge-verb, and many other non-bridge-verbs (e.g., *forget*, *threaten*, *convince*) do impose OC. For Huang (1989), the alleged NOC in (111) is attributed to an NP node dominating the clausal complement (as in Rosenbaum's 1967 original analysis). This is indeed the idea we have adopted for (106b) and (107). In support of this analysis, Huang cites the ability of communication verbs to select overt NP objects, undergo passive and pseudo-cleft. However, as Landau (2000) shows, none of these tests reliably distinguishes communication verbs from other standard OC verbs.[29]

To conclude this section, despite superficial exceptions, genuine NOC into nonfinite clausal complements is unattested – unless the complement is nominalized. This confirms the idea embodied in (96), which recognizes a purely configurational aspect in the distribution of OC.[30]

[29] For an extensive critique of the NOC treatments of English communication verbs (propounded in Bresnan 1982, Bouchard 1984, Huang 1989 and Sag and Pollard 1991), see Landau 2000: 157–166.

[30] A nominalized complement may allow NOC in certain languages, but it would be too strong to claim that it excludes OC. Languages like Turkish and Basque project both OC and non-control complements as nominalized clauses (see Section 4.1.2). Perhaps nominalization only has an effect on control in languages where not all clausal complements are nominalized. More research is needed to refine our understanding of the interaction between nominalized clausal complements and control. See Section 5.6.2 for discussion of control in DPs.

# 2 Control theories: a typology

In Section 1.1 we sketched the earliest generative attempts to develop a formal theory of control. As the Equi-NP Deletion transformation fell from grace, other theories of control emerged in different branches and schools of generative grammar: Montague Grammar, Categorial Grammar, the Extended Standard Theory, Government and Binding, Lexical-Functional Grammar, Head-Driven Phrase Structure Grammar and Minimalism. While it is possible to examine the different theories according to their official affiliations, such an approach is bound to miss important cross-theoretical insights. After all, notions like "structure-sharing," "predication" and "binding" have a relatively theory-neutral standing, and thus can guide us in clustering conceptually similar theories, which may be notationally quite disparate.

This is the strategy I adopt in this chapter. The different theories of control are clustered around a key notion or grammatical mechanism. First, the notion is explained; then, I discuss how different theories implement it in explaining the main patterns of control; lastly, I point out problems and critiques facing each type of approach.

## 2.1 Predication

In predicational theories of control, the crucial dependency holds between the controller and the entire infinitive/gerund (not its subject), which is taken to be a predicate. For example, a sentence like *Mary tried to swim* is interpreted along the lines of "In all worlds/situations in which Mary's attempt succeeds, she has the property of swimming." Predicational theories split according to whether they posit a syntactic PRO subject in the infinitive (Williams 1980, 1987, Lebeaux 1984, Clark 1990) or not (Bach 1979, Chierchia 1984, Dowty 1985, Culicover and Wilkins 1986). In the former variant, predication is taken to be encoded in the syntax; in the latter, it is a lexical entailment or some other non-syntactic relation. The predicational approach has been developed first as part of semantics, within Montague Grammar and its descendants, and later on within syntax, its popularity culminating in the 1980s.

Semantic versions of the predicational approach normally treat nonfinite complements as bare VPs (without PRO) that denote properties (Thomason 1974, 1976, Bach 1979, 1982, Chierchia 1984, 1989, Dowty 1985). The earlier treatments were concerned with distinguishing subject control from object control in terms of their syntactic and semantic composition. In Bach's Categorial Grammar analysis, *persuade* first combines with the infinitive to form a transitive verb phrase (TVP), which then combines with the matrix object; whereas *promise* first combines with the matrix object to form an intransitive verb phrase (IVP), which then combines with the matrix subject.

(113) a. John persuaded Mary to go: ((**persuade'**(**to go'**))(m))(j)
b. John promised Mary to go: ((**promise'**(m))(**to go'**))(j)

The controller is fixed by the "next argument" generalization: it is whatever argument combines with the predicate immediately after the infinitive does. The main argument in favor of this analysis was the explanation it afforded to "Visser's Generalization," which states that subject controlled predicative constructions cannot be passivized (i.e., *Mary was persuaded/*promised to go*). Passivization, Bach claimed, only applies to TVP categories and not to IVP categories.[1]

In Section 5.4 we will see that Visser's Generalization, as originally conceived in Categorial Grammar, is in fact spurious (and sometimes false). Independently of that, the Categorial Grammar analysis suffers from two weaknesses. First, the "discontinuity" assumption, by which *promise* and its goal argument form a constituent to the exclusion of the infinitival complement is unmotivated.[2] The hierarchical order of arguments is identical in *persuade* and *promise*, and whatever special properties the object of *promise* exhibits are reliably due to the fact that *promise* is a double object verb. Yet subject control is not limited to double object verbs (e.g., *vow*, *pledge*) nor is object control excluded for them (e.g., *tell*, *teach*, *ask*).

As to the possibility that the different composition of the two verbs is purely semantic, Sag and Pollard (1991: 105) cogently observe:

> In Montague semantics, real-world relations are modeled by functions from possible worlds to other functions, and the roles in those relations are modeled by the argument positions in those other functions. But the order of arguments of those other functions does not model anything; it is just an artifact of the model, much as the wheel, levers or

[1] Chierchia (1984: 343) argued that the controller must be allowed to be the argument combining with the predicate *either* immediately before *or* immediately after the nonfinite VP, on the basis of OC examples like *Mary recommends reading "War and Peace" to John*. This would rob Bach's analysis of an explanation for why object control is disallowed with *promise*, but not Chierchia's, which admits (lexically marked) control specifications.

[2] The only serious attempt to motivate this assumption on syntactic grounds is Larson 1991, which raises serious difficulties by itself (see Section 5.1.3).

pulleys in a desk-top model of the solar system don't represent any aspect of the solar system.

The most fully worked out predicational theory of control is developed in Chierchia 1984, 1989. For Chierchia, the "control reading" arises as a lexical entailment (a meaning postulate) associated with specific control verbs. The entailments can be systematized as follows.

(114) a. $E(\beta_r\ [P]) \Rightarrow E(\beta_r\ [P/P^*(\theta(\beta))])$
b. Th > Go > Ag . . .

Which reads: $\beta_r$ is an eventuality of type-r (where types are means of collapsing different guises of the same predicate under one label), which takes the property P as an argument; in our case, $\beta_r$ and P are the matrix and the infinitival predicates, respectively. $\theta$ is a partial function from eventualities to participants; thus the $\theta$-function "Agent" maps the verb *kick* in *John kicked the ball* to *John*, but is undefined for (say) the verb *fall*. The square brackets in the right-hand side of (114a) notate standard substitution ($\beta[\alpha/\gamma]$ is $\beta$ with $\gamma$ substituting $\alpha$). Given this, (114a) reads as follows: "Suppose that an r-eventuality $\beta$ that has the property P as one of its constituents is the case; then an r-eventuality obtained from $\beta$ by replacing P with the eventuality <P,x> (where x is the bearer of the role $\theta$ with respect to $\beta$) is also the case" (Chierchia 1989: 144). The specific $\theta$-role is selected according to the hierarchy in (114b) (subject to marked exceptions, e.g., *promise*). This is how "control" is captured in Chierchia's system. For instance, knowing that *John tried to swim* entails knowing that John tried to bring about a situation where he swims.

All nonfinite VPs in argument positions (OC/ECM/perception/causative complements) receive the same treatment in Chierchia's system: they are "nominalized properties," essentially 1-place properties which are mapped to a special kind of individual in order to be able to function as arguments. NOC infinitives and gerunds (i.e., subject of *bother*, object of *discuss*) are also nominalized properties (there is no $PRO_{arb}$,), which are simply not associated with any control entailment.

Chierchia's famous arguments for the property status of control complements are based on inference and *it*-anaphora patterns.[3]

(115) a. Nando likes everything Ezio likes.
b. Ezio likes playing tennis
c. ∴ Nando likes playing tennis.

(116) Ezio practised playing tennis for a year and Nando practised *it* for a month.

[3] A version of this argument, with different conclusions, was given in Fodor 1975: 142–145; see (20) in Section 1.2.1.

In (115c), the only possible reading of the conclusion is that Nando likes his own (Nando's) playing tennis, not Ezio's playing tennis. In (116) the only possible reading of the second conjunct is that Nando practised his own (Nando's) playing of tennis, not Ezio's. Thus, only sloppy but not strict readings are allowed in these contexts. Chierchia's point is that a theory that assigns a propositional status to the gerundive complements cannot account for these judgments; for it would assign the complement in (115b) and the complement in the first conjunct of (116) the denotation **play-tennis'**(Ezio). These values, substituted in the logical formulae of (115a) and replacing *it* in (116), would produce the impossible strict readings and fail to produce the sloppy ones. While one can imagine sophisticated ways to secure the requisite readings under a propositional theory of OC, nothing beyond the simplest, straightforward logical representations is needed under the predicational theory, which simply assumes that among the individuals that are liked and practised, (nominalized) properties are also found.

Chierchia's arguments are considered among the most solid results in the history of control.[4] However, a little-known paper, Ladusaw 1987, pointed out that they deliver less than what they purport to. First, Ladusaw noted that the validity of inferences like (115) should not depend on the choice of control verb, or even on identity of verbs in the first premise, but in fact, it does.

(117) a. John persuaded Mary of whatever Bill persuaded Susan (of).
b. Bill persuaded Sue to leave.
c. # John persuaded Mary to leave

(118) a. John wants whatever Mary told Susan.
b. Mary told Susan to leave.
c. # John wants to leave.

The reason that these inferences fail, Ladusaw claims, is that the sense of verbs *persuade* and *tell* in "persuade of X" or "tell X" is not the same as their sense in "persuade to" or "tell to"; the former is more akin to finite complementation ("persuade/tell that"). Thus the substitution of **to-leave'** for the variable bound by *whatever* is not legitimate. While the two senses of *try/practise/want* – the verbs tested by Chierchia – are close enough to make the inference go through, this is by no means the general pattern. Note that Ladusaw's critique does not challenge the main point of Chierchia, namely, that nonfinite complements must be allowed to denote properties for inferences like (115) to go through; rather, it indicates that this assumption is not *sufficient* to secure the validity of the inference. A second, more serious difficulty that Ladusaw raises for Chierchia's arguments will be shortly discussed.

[4] See Hellan 1980, Higginbotham 1992 and Dalrymple 2001 for a propositional treatment of the semantics of control complements, and Landau 1999 for an argument that certain control complements (of psychological adjectives) must be propositional.

Syntactic versions of the predicational approach stem from Williams' (1980) seminal work. For Williams, OC was but one instance of a prevalent syntactic relation, predication, which is established at a special grammatical level (PS, predicate structure). Predication is very local: the NP must be in a mutual c-command relation with the predicate or with another predicate that immediately contains it (i.e., the matrix VP). The former case subsumes adjunct OC, the latter subsumes complement OC, in which a complex predicate, the VP, contains another one, the nonfinite clause. Nonfinite clauses can be predicative in virtue of PRO, their "open position."

The core properties of OC (as Williams understood them) are supposed to follow from general conditions on predication: (i) PRO cannot alternate with a lexical NP; (ii) the controller must c-command the infinitive (and PRO); (iii) the controller must be uniquely determined; (iv) there must be an overt controller. Subsequent research (e.g., Wyngaerd 1994: 246–255) has, in fact, undermined the criterial status of these properties (see Sections 1.3., 5.3 and 5.4). Note that syntactic predication cannot be reduced to semantic predication, being subject to stricter conditions. Thus, the interpretation of OC constructions (or some of them) may well involve a predicational step (where the denotation of the nonfinite clause applies to the denotation of the controller) without this being encoded by a special means at some special syntactic level.

As to NOC, although it incorrectly includes many complements for Williams, it also includes all subject (nonfinite) clauses. Subject clauses can never function as predicates, since no NP they c-command mutually c-commands them. Therefore they are assigned the index *arb*. This index may give rise to an arbitrary reading of PRO, but the optional "Arb rewriting Rule II" may coindex the clause with a commanding NP, producing long-distance control. Interestingly, Williams thought that extraposed clauses as in (97c) are subject to OC (contrary to fact), so he posited an *obligatory* "Arb rewriting Rule I," which takes precedence if the commanding NP is also commanded by the clause.

Williams' theory has been adopted and adjusted by various authors. Lebeaux (1984, 1985) "fuses" Williams 1980 and Manzini 1983, arguing that OC PRO is an anaphor whose interpretation is indirectly determined by predication. Clark (1990) assimilates OC to null operator constructions: PRO is a trace of a null operator that turns the nonfinite clause into a predicate, as in (119). We return in Section 6.2 to the predicational analysis of adjunct control.

(119) a. $\text{John}_i$ wanted [$_{CP}$ $\text{Op}_i$ [$_{IP}$ $t_i$ to kick himself]].
b. $\text{John}_i$ felt old [$_{PP}$ after [$_{CP}$ $\text{Op}_i$ [$_{IP}$ $t_i$ seeing himself in the mirror]]].

Lebeaux and Clark assume that in non-predicational contexts (i.e., NOC), the null operator picks either a discourse antecedent or a generic reading (see Chapter 7).

The key question that predicational theories must address is whether OC indeed displays the characteristic properties of predication. In Chapter 5 we

will discuss a number of contexts that bring out differences between a subject of predication and OC controllers. Specifically, a subject of predication must be syntactically overt and unique; in contrast, OC controllers may be implicit, partial or split.

Nevertheless, there is a subclass of OC predicates that do impose a stricter relation between the controller and the nonfinite complement. They include aspectual, modal and implicative verbs, forming what Landau (2000) calls the exhaustive control (EC) class (e.g., *begin*, *try*, *dare*, *fail*, *manage*, *able*, *force*). This class stands out in a number of ways. First, EC verbs disallow shifting, partial or split control (see Sections 5.1.2, 5.2–5.3); second, their complements are untensed (the embedded event must coincide with the matrix event); third, crosslinguistically, they consistently allow restructuring (Wurmbrand 2002, 2003).

In restructuring contexts, the embedded infinitive is reduced, allowing long A-movement (passive or scrambling) into the matrix clause. Wurmbrand shows that for such movement to be possible, the infinitive must be a bare VP, lacking all functional projections, and crucially, lacking a structural PRO subject. These infinitives, therefore, perfectly match Chierchia's property-denoting complements. Their missing subject can only be supplied by predication.

However, Wurmbrand also shows that Chierchia's sweeping claim, that all subjectless infinitives must denote properties, cannot be maintained. Non-EC verbs (e.g., *promise*, *decide*, *plan*, *offer*), when combining with infinitives, disallow a lexical subject just like EC verbs do. Yet these complements may denote propositions, as evidenced in their tolerance to partial and split control. More interestingly, the two types of verbs contrast under the *it*-anaphora test, as shown in (120) for German. As an object of an EC verb, *it* must be interpreted sloppily, but as an object of a non-EC verb, it allows a strict reading.

(120) a. Hans beschloβ zu heiraten [nachdem Peter es gewagt hatte].
John decided to get.married after Peter it dared had
(i) Sloppy: 'John decided to get married after Peter had dared to get married.'
(ii) *Strict: *'John decided to get married after Peter had dared 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
(i) Sloppy: 'John dared to get married after Peter had announced that he, Peter, would get married.'
(ii) Strict: 'John dared to get married after Peter had announced that John would get married.'

The readings are sensitive to whether the verb selecting *it* allows a property or a propositional complement. The verbs *decide* and *announce* are non-EC verbs

(but still OC verbs when selecting infinitives!), while *dare* is. Therefore, *it* in (120a) must pick a property as an antecedent, the property of getting married. Note that the antecedent infinitive is selected by *decide*, which allows either a property or propositional complement. In contrast, *it* in (120b) is selected by *announce*, thus permitting a propositional antecedent (John's getting married), the source of the strict reading. This proposition is only contextually constructed (by the control entailment, applying "getting married" to *John*), since the antecedent infinitive is a property selected by *dare*.[5]

The latter possibility reveals a loophole in Chierchia's analysis, as Ladusaw (1987) observed. The fact that a strict reading is available even when the antecedent clause is property-denoting confirms that the constructed proposition, although not syntactically present, is semantically available. The question, then, is why does it not render the strict reading of the complement a valid conclusion in inferences like (115). In other words, if *Ezio likes playing tennis* entails the (modalized) proposition *Ezio plays tennis*, and *like* is a verb that allows a propositional complement, why can the conclusion of (115a–115b) not be *Nando likes Ezio's playing tennis*? Ladusaw leaves this as an open problem, but we may draw the following conclusion: unlike the antecedent for *it*, which need not be a syntactic constituent, the range of the universal quantifier (*everything*, *whatever*) would seem to include only semantic values of syntactic constituents. This unrecognized assumption is necessary in order to prevent the unwanted inference in (115).

To sum up, we may conclude that the predicational analysis of OC captures a central aspect of the semantics of one subclass of OC verbs, but cannot be the single mechanism that generates OC in the grammar.

### *Further reading*

For relevant works on the topic of Section 2.1, see Bach 1979, 1982, Chierchia 1984, 1989, Dowty 1985, Williams 1980, 1987, 1992, 1994, Lebeaux

[5] It is worth pointing out that the restructuring analysis of EC complements is only motivated for languages displaying restructuring properties. Thus, in languages like English (or Hebrew) EC complements do not possess any syntactic characteristic exclusive to them. Likewise, EC complements in Balkan languages are (inflected) subjunctive clauses, not VPs.

Wurmbrand's (2002) main point is that EC interpretations (disallowing partial, split and shifting control) are forced with certain verbs (like *try*, *dare* etc.) whether or not restructuring takes place in their complement. Thus, the EC interpretation may arise in two different ways. In restructuring infinitives, by predication, and in non-restructuring infinitives, by some lexical entailment pertaining to the PRO subject of the complement. The latter procedure, however, requires a non-local dependency between the control verb and an argument of its argument. As an alternative, we may suppose that predication is the *sole* semantic source of obligatory EC interpretations, but the predicate itself could either be underived (a restructured bare VP) or derived by λ-abstraction (a clausal complement), PRO serving as the abstractor, as in Clark's execution (119).

1984, 1985, Clark 1990, Culicover and Wilkins 1986, Babby 1998, Wurmbrand 2001.

## 2.2 Binding

In binding theories of control, OC PRO is viewed as a null anaphor, whose binding domain is the clause immediately dominating the nonfinite complement. NOC PRO is treated either as an anaphor lacking a binding domain, hence exempt from binding (Manzini 1983, Sag and Pollard 1991), an Ā-anaphor (Lebeaux 1984, Borer 1985, Clark 1990), a pronoun (Bouchard 1984, Koster 1984, Hornstein and Lightfoot 1987) or a logophor (Kuno 1975, Williams 1992, Landau 2000, 2001, Manzini and Roussou 2000).

The first issue that binding theories of OC must address is why the binding domain of PRO extends to the matrix clause (but not beyond) whereas that of a lexical subject anaphor is confined to the embedded clause.

(121) a. $\text{John}_i$ hoped [$\text{PRO}_i$ to impress his roommates].
b. * $\text{John}_i$ hoped [that $\text{himself}_i$ would impress his roommates].

There are three possible responses to this question. One, assign different binding domains to overt and null anaphors, specifically, require the latter to be bound in the minimal NP/S containing the c-domain of the null anaphor (where the c-domain is the minimal maximal projection containing the anaphor) and a governor for the c-domain (Lebeaux 1984). In this account, the distinction between lexical anaphors and PRO is stipulated. A second possibility, proposed in Manzini 1983, is to require an anaphor without a governing category to be bound in its *domain-governing category* (=the governing category of its c-domain, which must have an accessible subject). The effect is the same: PRO in a complement clause must be bound by a matrix DP.[6]

Manzini's innovation was the proposal that PRO without a binding domain (=domain-governing category) is exempt from binding. The OC/NOC distinction was derived as follows. Complement clauses always have a binding domain, the matrix clause; therefore, the controller must be found in that clause. Subject clauses lack a binding domain since the clause immediately dominating them has no accessible subject (Agr being coindexed with the subject clause itself, violating i-within-i). Extraposed clauses are coindexed with the subject expletive, again lacking an accessible subject and a binding domain. Thus, Manzini correctly predicted OC in (97a) and NOC in (97b–97c), though she incorrectly predicted NOC in (99a) as well. The idea that an anaphor without

[6] A different route to the same result is to remove the condition "contains a governor" from the definition of the binding domain (Wyngaerd 1994). PRO is assumed to be governed and case-marked internal to the infinitive (see Section 4.2), but the binding domain extends to the higher clause because the infinitive contains no accessible SUBJECT in the sense of Chomsky 1981.

a binding domain is exempt from condition A was adopted in Sag and Pollard 1991 and, under a different terminology, in Huang 1989.

The third response to the asymmetry in (121) is to assume that OC complements are smaller than finite complements. Specifically, they are non-maximal (S and not S') or TPs rather than CPs (Bouchard 1984, 1985, Koster 1984, 1987, Hornstein and Lightfoot 1987). The desired effect is to allow the matrix verb to govern PRO, making its governing category (=the binding domain) the entire matrix clause. A governed PRO is, of course, an impossibility in Chomsky's (1981) theory, but in the binding theory of control it is simply *defined* as an anaphor; an ungoverned PRO (occurring in subject clauses) is a pronoun, yielding NOC.

To illustrate, Koster (1984) discusses certain infinitival complements in Dutch, which can appear before or after the matrix verb. The first option is triggered by V-raising (of the infinitival verb to the matrix one), the second option is triggered by extraposition of the complement to the right of the matrix verb. This split correlates with two other properties. Only extraposed clauses may occur with a complementizer (*om*) and tolerate matrix passivization (122a–122b) ((122c) shows that V-raising is possible when the matrix clause is not passivized).

(122) a. Er werd $t_i$ geprobeerd [(om) PRO Bill te bezoeken]$_i$.
there was tried COMP Bill to visit
'It was tried to visit Bill.'

b. * Er werd [PRO Bill $t_i$] geprobeerd te bezoeken$_i$.
there was Bill tried to visit
'It was tried to visit Bill.'

c. Zij had [(*om) PRO het boek $t_{i]}$] probeerde te lezen$_i$.
she had (*COMP) the book tried to read
'She tried to read the book.'

According to Koster, (122a) is an instance of NOC. PRO occurs inside S', protected from government, hence it is a pronoun that needs no matrix binder. (122b), on the other hand, is an instance of OC. The infinitive (which resists COMP, see (122c)) must be a non-maximal S, transparent to government of PRO. This anaphoric PRO finds no matrix binder, hence the ungrammaticality of (122b).

Note that the facts equally follow on Wurmbrand's restructuring analysis (see Section 2.1). V-raising signals restructuring, so the infinitive in (122b) is a bare VP – a predicate. Predicates must be predicated of an overt DP, unlike PRO, which may be controlled by an implicit argument (the matrix agent in (122a)). We return to this distinction in Section 5.4. More generally, the claim that OC clauses cannot be introduced by complementizers is crosslinguistically untenable, as discussed in connection with (56)–(57) (see also Section 3.1).

An ingenious application of binding theory to OC is developed in Borer (1989). In Borer's system, the anaphoric element is the infinitival Agr (part of Infl), not the null subject, which is simply *pro*. The anaphoric Agr raises to C, where it may be locally bound by a matrix DP.[7] Conditions on the identification of *pro* require that it be coindexed with the anaphoric Agr, which transmits to it the features of the antecedent. Thus, "control of PRO" reduces to "binding of Agr."

Borer's analysis has certain undeniable advantages. First, it preserves the standard definition of a binding domain as a governing category; once in C, the governing category of the anaphoric Agr extends to the matrix clause.[8] Second, it dispenses with PRO as a distinct null category. Third, it elegantly handles the distribution problem: only subjects can be controlled because only subjects are coindexed with Agr. Thus, no need arises to invoke special syntactic conditions on PRO (ungoverned, null case etc.). Finally, Borer's was the first study of control that seriously engaged crosslinguistic diversity, accounting for languages (like Korean) where controlled subjects may be lexicalized as pronouns or anaphors, and languages (like Hebrew) where OC applies to finite complements. Since the crucial anaphoric element is Agr and not the embedded subject, nothing prevents factoring out the lexicalization of this subject (handed over to case theory in Borer's analysis) or the finiteness of the complement from the [+anaphoric] property of Agr.

Turning to HPSG (Sag and Pollard 1991), the controllee in OC is defined as a reflexive, which is subject to condition A (framed in terms of *local o-command*, a prominence relation over the scale of obliqueness). The local binding domain, as in Manzini 1983, is the matrix clause, and uncommanded reflexives, again as in Manzini, are exempt from condition A. For standard OC cases, condition A is in fact redundant with the control principle (see (223) below), which selects a local controller on the basis of semantic roles. The effects of local binding are only visible under the special circumstances of *control shift* (as in *John promised Mary to be allowed to leave*), where the control principle fixes the reference of an interpolated (hidden) causer but not the reference of the controlled subject. The relevance of binding to these cases, therefore, depends entirely on the status of the "causative coercion" analysis of control shift, which is not without problems (see Section 5.1.2). The other function of condition A in the HPSG theory of control is to explain "Visser's generalization," whose empirical content needs to be reconsidered (see Section 5.4). Overall, then, it seems that despite the explicit integration of binding into the HPSG control

[7] Borer thus predicts OC to be incompatible with lexical complementizers. Again, this situation is quite possible is some languages (see Section 3.1).

[8] Kayne's (1991) analysis shares this advantage. Although Kayne follows Chomsky (1981) in taking PRO to be both pronominal and anaphoric, his particular implementation derives the locality of OC from the locality of anaphoric binding; see Section 4.1.1.

theory, the actual nonredundant work that is done by binding condition A is peripheral and possibly dispensable.[9]

The question what explains the nullness of PRO is rarely raised in binding accounts. One explicit attempt to deal with it is proposed in Sundaresan 2010. Sundaresan assumes that OC PRO and overt SELF-anaphors are featurally identical up to pronunciation; indeed, they are allomorphs whose alternation is syntactically conditioned. Essentially, an anaphor will be pronounced if it is bound within its spell-out domain (normally, the minimal CP). Otherwise, the anaphor remains featureless and cannot be pronounced, resulting in PRO.

Abstracting away from difficulties with specific implementations, a number of binding-control asymmetries militate against any binding theory of OC (Mohanan 1985, Farrell 1993, Landau 2000: 115–118). We briefly mention them.

OC controllers are designated arguments – usually subject or object, but not both; binders are not thematically restricted (Lasnik 1992).

(123) a. $\text{John}_i$ told $\text{Mary}_j$ about $\text{himself}_i$/$\text{herself}_j$.
b. $\text{John}_i$ told $\text{Mary}_j$ [$\text{PRO}_{*i/j}$ to leave].

The standard response (e.g., in Manzini 1983), that controller choice is sensitive to semantic/pragmatic factors, is no doubt correct, but begs the question: if OC *is* binding, the fact that OC alone but not binding is subject to these conditions is unexplained.

Furthermore, implicit arguments can control but not bind (Rizzi 1986a). Rizzi distinguishes between generic contexts, where a dative *pro* may be projected, and non-generic contexts, where it may not. Nonetheless, an implicit dative argument in the latter context can still control, but not bind (124); similar facts obtain in English (125).[10]

(124) a. Lo psichiatra (gli) ha detto [di PRO parlare di se stessi].
the psychiatrist (to.him) has said of to.talk of himself
'The psychiatrist said (to him) to speak about himself.'
b. Lo psichiatra *(gli) ha restituito se stessi.
the psychiatrist (to.him) has returned himself
'The psychiatrist gave *(him) back himself.'

(125) a. $\text{Mary}_1$ thought that John said (to $\text{her}_i$) [$\text{PRO}_i$ to wash herself].
b. $\text{Mary}_i$ thought that John talked $^*$(to $\text{her}_i$) about $\text{herself}_i$.
c. John admitted that it was quite dishonest (of $\text{him}_i$) [$\text{PRO}_i$ to clear himself of any responsibility].
d. John admitted that Mary was quite dishonest $^*$(to $\text{him}_1$) about himself.

[9] Indeed, Farrell (1993) factors out the binding-theoretical component of Sag and Pollard's theory, which he otherwise follows at large. He too, however, assumes that Visser's generalization is valid, and offers a binding-free account of it.

[10] Panther (1997) makes the same point in arguing against Sag and Pollard's 1991 idea that PRO is an anaphor, pointing to numerous examples of implicit control into complements in German.

An anaphor in an argument position cannot have a split antecedent, whereas PRO sometimes can (see Koster and May 1982, Petter 1998, and Section 5.3 below).

(126) a. * John$_i$ showed Mary$_j$ to themselves$_{i+j}$.
b. * John$_i$ suggested Mary$_j$ to themselves$_{i+j}$.
c. John$_i$ persuaded/proposed to Mary$_j$ [PRO$_{i+j}$ to get themselves a new car].

It is well-known that in certain languages (e.g., Polish, Icelandic, Korean, Japanese) some or all anaphors are subject-oriented. Yet in none of these languages, nor in any other languages we know of, is PRO strictly subject-oriented in all environments (Kavalan may be an exception; see Chapter 5 fn. 1). This systematic discrepancy is an accident under the view that PRO is an anaphor.

Consider also the fact that in some languages case marking interferes with binding but not with control. In German, for example, dative DPs can control but not bind (Wurmbrand 2001).

In VP-ellipsis contexts, a subject anaphor allows a strict reading, whereas PRO forces a sloppy reading, an unexplained contrast on the binding account.

(127) a. John believes [himself to be intelligent], but no one else does. [sloppy or strict]
b. John claims [PRO to be intelligent], but no one else does. [only sloppy]

Finally, (local) binding obeys c-command whereas it is quite possible that OC obeys some weaker condition of "command" or "containment in the same VP-shell" (Chierchia and Jacobson 1986, Landau 2000).

*Further reading*

For relevant works on the topic of Section 2.2, see Manzini 1983, 1986, Bouchard 1984, 1985, Koster 1984, 1987, Lebeaux 1984, 1985, Hornstein and Lightfoot 1987, Borer 1989, Saxon 1989, Sag and Pollard 1991, Kayne 1991, Kawasaki 1993, Wyngaerd 1994, Rooryck 2000, Sundaresan 2010.

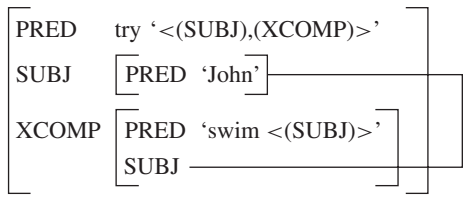
## 2.3 Lexical-functional grammar

In LFG control is established at f-structure, the level where grammatical functions are encoded, and not at c-structure, the level of syntactic constituency. Two types of control are distinguished: *functional control* and *anaphoric control*. In functional control, the controller and controllee have identical grammatical features because they share a single value at f-structure (this is also known as "structure sharing"). In anaphoric control, the controller and controllee only have identical reference, as in a pronominal dependency, and need

not share all grammatical features. Empirically, functional control covers raising constructions and anaphoric control covers NOC. OC constructions split between functional and anaphoric control. This is the basic picture in Bresnan's (1982) seminal study, which we lay out below (later modifications are sketched too).

Functional control only applies to subjects (an underived axiom in LFG). Hence, only the open functions XCOMP and XADJ, which cannot take structural subjects, can be functionally controlled. Complement functional control is lexically induced; a control equation, e.g., (↑ SUBJ) = (↑ XCOMP SUBJ), identifying the controller in the matrix clause, is part of the lexical entry of the matrix predicate. Adjunct functional control is constructionally induced; the control equation is added to the f-structure of the adjunct. We illustrate the former case below.

(128) John tried to swim.




The properties of functional control roughly correspond to those of obligatory control proposed by Williams (1980).

First, semantically restricted functions cannot be functional controllers; only SUBJ, OBJ and OBJ2 can. It follows that oblique controllers must exercise anaphoric control.

Second, a functional controller cannot be omitted, for this would create an incomplete f-structure in the controlled clause: the SUBJ of XCOMP (or XADJ) would be assigned no value. This accounts for both Visser's and Bach's generalizations, which govern the omissibility of controllers (see Section 5.4.1).

Third, a functional controller must be unique and cannot be split; multiple controllers would produce a feature clash in the f-structure of the controllee.

Fourth, functionally controlled categories cannot host lexical subjects, because they must be open functions.

Fifth, because functional control involves feature sharing, the controller and controllee must agree in their case value. A mismatch in case implies anaphoric control (Andrews 1982, Niedle 1982).

Consider next anaphoric control. The primary examples of this type involve subject and adjunct clauses (Bresnan 1982, Mohanan 1983). These must be the closed functions SUBJ and ADJ, whose f-structure contains a *functional anaphor*, PRO, typically in subject position (note that PRO is absent from c-structure; gerunds and infinitives only project a VP). The conditions on

anaphoric control are complex, but in general, less stringent than the conditions on functional control. Thus, PRO in anaphoric control requires no overt controller, may take split antecedents, may alternate with a lexical NP and may bear distinct case from its controller. Furthermore, in certain languages PRO may occur in nonsubject positions – either OBJ or OBJ2 (these would be analyzed as *pro* outside LFG).

The f-structure of a typical anaphoric control constructions is given in (129). Note that the understood subject of the gerund may pick its reference rather freely, a hallmark of NOC.

(129) Peeling oranges repulses Mary.

$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{U} & + \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'oranges'} \end{bmatrix} \\ \text{PRED} & \text{'PEEL<(SUBJ),(OBJ)>'} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'Mary'} \end{bmatrix} \\ \text{PRED} & \text{'REPULSE<(SUBJ),(OBJ)>'} \end{bmatrix}$$

The feature [+U(nrealized] – introduced by Bresnan (1982) but discarded in later work – distinguishes PRO from overt pronouns (which are [−U]). It is needed in order to express specific conditions on anaphoric control that do not constrain pronominal reference in general. Although PRO in anaphoric control may pick extra-sentential antecedents (and as such, Bresnan observed, contrasts with standard anaphors), whenever a grammatical antecedent is selected, it must obey a locality condition – the controller must *f-command* PRO (every f-structure that contains the controller must contain PRO). Overt pronouns are exempt from this condition, as the following pair illustrates.

(130) a. * Contradicting himself will demonstrate that Mr. Jones is a liar.
b. His contradicting himself will demonstrate that Mr. Jones is a liar.

Anaphoric control is also instantiated in a subclass of complement infinitivals in English. These are complements whose subject position is optionally filled by an overt NP (preceded by the complementizer *for*) or any complement that is controlled by a semantically restricted function, like GOAL.

(131) a. Fred wished [(for Sue) to leave].
b. Fred signaled (to Sue) [to leave].

Given that anaphoric control, in general, need not be local, how does the grammar force *Fred* as the controller in (131a) and *Sue* (when present) as

the controller in (131b)? The latter is simply attributed to semantic factors: the thematic structure of the matrix verb may induce OC even in anaphoric control. The former is treated by the Obviation Principle, which states that a [−U] (i.e., overt) subject of an obviative clause (like a *for*-infinitive) is obviative to the matrix subject and a [+U] (i.e., PRO) subject is bound to it.

In Bresnan 1982, the mapping between f-structure and semantics is straightforward. Open functions are predicative while closed functions are propositional. This implies that functionally controlled clauses denote properties and anaphorically controlled clauses denote propositions. In Dalrymple 2001 functional control (in English) is restricted to raising and all OC constructions are analyzed as anaphoric control. In the semantics, however, the distinction is blurred, as all clausal complements are taken to denote propositions. Another variation is developed in Asudeh 2005, where Bresnan's original partition of OC verbs to functional and anaphoric control is maintained, however the interpretative procedure (framed in Glue Semantics) is elaborated to handle either a property or a propositional denotation for any controlled clause. Cases of finite control (as in Serbo-Croatian, Zec 1987) are uniformly classified under anaphoric control, since finite clauses are necessarily closed functions assigning a SUBJ value at f-structure.

The LFG theory of control faces several problems, which we mention briefly below, with references to more detailed comments in subsequent sections.

As indicated, Bresnan's distinction between functional and anaphoric control essentially replicates Williams' (1980) OC-NOC distinction as far as the behavioral criteria are concerned. However, as often discussed (e.g., see Landau 2000: 31–33), Williams' criteria are inconsistent within English and are often inapplicable outside it. Thus, complements that resist a lexical subject may still allow split control; complements that allow a lexical subject need not allow the controller to be omitted; and whether or not the controller is an unrestricted function or an oblique argument does not correlate reliably with other OC criteria.

In general, the possibility of argument drop is an independent lexical property of verbs and cannot be taken as evidence for functional control (see Section 5.4.1). Patterns of case transmission are considerably more complex than the LFG literature portrays (often the case of the controllee alternates), again failing to provide a clear diagnostic for functional vs. anaphoric control (see Section 4.2). Contra to LFG's prediction, controllers never inherit a lexical/quirky case assigned to the controllee, which is the standard pattern in raising (cf. Bobaljik and Landau 2009 and the references therein). As Davies (1988) pointed out, this striking asymmetry casts doubt on the relevance of LFG's "functional control" to control phenomena.

Overall, in many languages there is simply no reliable method of telling whether a given construction displays functional or anaphoric control. This

raises the suspicion that the functional-anaphoric distinction is not *anterior* to the OC-NOC distinction but rather parasitic on it. Furthermore, the idea that raising and (certain) OC constructions are analytically equivalent – both involving structure sharing – in many ways prefigures the Movement Theory of Control (see Section 2.4) and faces similar difficulties in accounting for many structural contrasts between raising and OC, as discussed in Section 1.2.

The characterization of anaphoric control is also problematic. In OC contexts, there seems to be considerable redundancy between the potential scope of the Obviation Principle and the scope of thematically induced OC. Specifically, since one can make a reasonable case for thematic determination of control even in *want*-type verbs, it is not clear whether the Obviation Principle is relevant to OC (as indeed Bresnan 1982: fn. 8 hints). More seriously, the f-command condition on NOC is false, as discussed at length in Section 7.2; nonstructural factors govern the reference of PRO in these environments.

*Further reading*

For relevant works on the topic of Section 2.3, see Bresnan 1982, 2001, Neidle 1982, 1988, Andrews 1982, 1990, Mohanan 1983, 1985, Richardson 1986, Zec 1987, Davies 1988, Arka and Simpson 1998, Kroeger 1993, Dalrymple 2001, Asudeh 2005, Falk 2006.

## 2.4 A-movement

The A-movement theory of control holds that within the minimalist program, there is no longer substantial reason to keep raising and control theoretically distinct. OC is analyzed as an A-chain formed by movement; the tail of the chain is an unpronounced copy/trace (formerly, PRO) and the head of the chain is the controller. NOC arises when movement out of the nonfinite clause is blocked, because it is an island; a last-resort *pro* is inserted as the subject of the clause to save the structure (see Section 7.2 for further discussion).

The conflation of raising and control was first envisioned in Bowers 1973, 1981. Within minimalism, its prominent advocates are Hornstein and Boeckx (Hornstein 1999, 2001, 2003, Boeckx and Hornstein 2004, 2006a, 2006b, 2007; for somewhat different implementations, see O'Neil 1997 and Manzini and Roussou 2000). Below we present Hornstein's theory.

A number of theoretical motivations animate the A-movement theory of control. First, the evaporation of D-structure as a linguistic level implied discarding all grammatical conditions that purportedly hold at that level. One such condition required all and only D-structure positions to be θ-positions. This

implied that movement, which occurs at S-structure, can never move an argument into a θ-position, because that position should have already been filled at D-structure. With D-structure gone, this result is also gone: movement can target θ-positions.

Within GB, there was another principle that (redundantly) prohibited movement into a θ-position – the θ-criterion. This criterion has two parts: every argument must receive a unique θ-role and every θ-role must be assigned to a unique argument. Hornstein pointed out that the uniqueness condition built into the first part is a stipulation whose empirical merit is unclear.

If arguments can accumulate two (or more) θ-roles along their movement path, the road is clear to derive OC as an instance of A-movement.

(132) $[_{IP}$ Mary $[_{VP}$ ~~Mary~~ *v*+hopes $[_{IP}$ ~~Mary~~ to $[_{VP}$ ~~Mary~~ *v*+win]]]]

θ-assignment is assimilated to feature checking, which must be local. In (132) the DP *Mary* checks two θ-roles, in the embedded and the matrix [Spec,vP] positions. It checks EPP twice, in the embedded and in the matrix [Spec,IP] positions, the latter also being its (nominative) case position. A slightly different version is presented in Bowers 2008, where θ-roles are preserved as semantic relations external to syntax, and the trigger for raising the controller is c-selection (subcategorization) by the matrix predicate.

Conceptually, the A-movement theory of control is of a kind with functional control in LFG, both relying on the notion of *structure sharing* between the controller and controllee (see Sells 2006).

The main properties of complement OC follow. The controlled position is unpronounced for whatever reason A-traces in general are unpronounced. Within the A-movement theory, the answer ultimately reduces to case – the DP can only be pronounced in a case position due to the way the PF (phonological form) algorithm of copy pronunciation works (Nunes 2004). Nonetheless, one expects and indeed finds instances of "backward control," where the controller is null and the controllee overt (see Section 4.4.2).

The controller must c-command the controllee, because standard movement (within a single tree) targets c-commanding landing sites. It must be unique (no split antecedents), since two discontinuous NPs cannot originate from the same position. The controllee is interpreted as a bound variable with a *de se* reading – arguably, as the A-trace of raising is.

Two further significant simplifications follow, according to Hornstein. First, the inventory of null formatives is reduced, PRO becoming superfluous (an unpronounced copy in disguise). Second, the "control module" – that part of grammar that selects the controller in OC – also becomes superfluous. Controller choice follows from the locality of A-movement. In particular, object control takes precedence over subject control (in the unmarked case). Rosenbaum's MDP reduces to the Minimal Link Condition (MLC) on movement

chains. The distribution and the interpretation or "PRO" are seen as two facets of the same theory – movement theory.

The treatment of OC into adjuncts proceeds similarly, with the important proviso that "sideward movement" (Nunes 2004) is allowed. Sideward movement involves moving (that is, copying and remerging) an element from one subtree to another, disconnected subtree. This type of movement can circumvent adjunct islands: the subject of a nonfinite adjunct moves into the specifier of the matrix vP position *before* the adjunct is adjoined to that vP.

(133) a. [$_{IP}$ John [$_{I}$ past [$_{VP/VP}$ [$_{VP}$ ~~John~~ [heard Mary]]
[$_{Adjunct}$ without [$_{IP}$ ~~John~~ [$_{I}$ ing [$_{VP}$ ~~John~~ [$_{VP}$ entering the room]]]]]]]]

A number of technical assumptions about derivational economy and locality guarantee that adjuncts will always be controlled by subjects and not by objects.

The A-movement theory of OC has met with considerable criticism. One line (Culicover and Jackendoff 2001, 2006, Rooryck 2007) focuses on the semantics of control constructions; in particular, it is argued that the choice of controller in OC and the phenomenon of control shift (see Sections 5.1.1–5.1.2) lie purely within the domain of lexical semantics, presenting complexities to which the A-movement theory cannot respond. In Section 5.1.3 below we review the empirical challenges facing MDP-accounts, concluding that they are indeed insoluble in terms of syntactic locality alone (see Boeckx and Hornstein's (2003) reply to Culicover and Jackendoff's criticism).

A second line of criticism is more syntactic in nature, pointing out numerous empirical problems – both over- and undergenerated data – raised by the A-movement theory (see Landau 2003, 2007, Kiss 2004, Runner 2006, Bobaljik and Landau 2009, Barbosa 2009, Ndayiragije 2012, Modesto 2007b, 2010a, 2011, Sato 2011, Wood 2012, and the replies in Hornstein 2003, Boeckx and Hornstein 2004, 2006a, 2006b, Boeckx, Hornstein and Nunes 2010a).

Overgenerated cases involve: (i) passivization of the embedded subject (134a); (ii) sideward movement out of complements (134b); (iii) "reflexive" implicit control (134c). In all these cases, there is nothing to block the movement of the embedded subject to the matrix clause.

(134) a. * John$_i$ was hated [t$_i$ to live like that].
b. * John's$_i$ examination of the patient convinced Mary [t$_i$ to applaud himself].
c. * John$_i$ [$_{vP}$ t$_i$ said t$_i$ [t$_i$ to [$_{vP}$ t$_i$ return later]]]
[≠ John said to himself to return later]

Undergenerated cases involve split and partial control (see Sections 5.2–5.3), for obvious reasons: The head of an A-chain must be featurally identical to its trace and cannot be split.

Another type of problem is OC-NOC misclassifications. The A-movement theory classifies *wh*-complements under NOC (being islands for movement) and classifies *all* adjuncts under OC (via sideward movement). Neither prediction is confirmed: *wh*-complements display OC (of the partial kind, see Section 5.2) and initial temporal adjuncts are subject to logophoric control, which is NOC (see Chapter 7). A further point of contest is locally controlled subject clauses, which are classified as OC by the MTC but in fact, display NOC properties (see Section 5.5 and Chapter 7).

A third type of problem involves raising-control contrasts (see Section 1.2) that are lost under the A-movement theory. Among these are: (i) raising complements are TPs, control complements are CPs; (ii) raised NPs may "strand" material in the embedded clause (partitive clitics), controllers may not; (iii) raised NPs preserve their lower case, controllers get their case in the matrix clause (see Section 4.2). For extensive discussion of these and other problems, see Landau 2003, 2007, Bobaljik and Landau 2009.

*Further reading*

For relevant works on the topic of Section 2.4, see Bowers 1973, 1981, 2008, O'Neil 1997, Hornstein 1999, 2001, 2003, Manzini and Roussou 2000, Boeckx and Hornstein 2004, 2006a, 2007, Rodrigues 2004, 2007, Alboiu 2007, Pires 2007, Ferreira 2009, Hornstein and Polinsky 2010b, Boeckx, Hornstein and Nunes 2010b.

## 2.5 Agree

The Agree model of control utilizes the basic syntactic operation Agree (Chomsky 2000, 2001) in the implementation of complement OC. Agree matches a matrix probe with an embedded goal. The matrix probe is some functional head (T, light v or an applicative head) that forms a prior Agree relation with the controller DP. The goal is either PRO or Agr (=a ϕ-set) in the embedded C. Coindexation of the matrix probe with both PRO and the controller produces a bound-variable reading, i.e., OC (Landau 2000, 2004, 2006, 2007, 2008). Agree cannot penetrate islands, hence adjunct and subject clauses fall outside its purview. Subject and extraposed clauses indeed display NOC (see (96)); adjuncts roughly fall under two types, predicative and logophoric (see Chapter 7), neither of which involves Agree.

The Agree model is designed to explain two facets of control that have suffered from neglect for a long time: partial control and finite control. In partial control, the reference of PRO properly includes the reference of the controller (the standard notation is $PRO_{i+}$). In finite control, the embedded verb is inflected for tense and agreement.

(135) a. *Partial control*
Our dean$_i$ decided [PRO$_{i+}$ to meet once more before the vacation].

b. *Finite control (Hebrew)*
Rina bikša me-Gil$_i$ [še- PRO$_i$ yivdok šuv et
Rina asked from-Gil that would.check.3SG again ACC
ha-toca'ot].
the-results
'Rina asked Gil to double-check the results.'

As shown at length in Landau (2000, 2004) and the references therein, both partial and finite control bear the OC signature. Thus, they pose nontrivial challenges to classical theories of OC, which assumed strict identity between PRO and its antecedent and excluded PRO from finite environments. We return to partial control and the attempts to explain it in Section 5.2 and to finite control in Section 4.1.

The Agree model maintains that the entire spectrum of complement types observed in the world's languages (small clauses, infinitives, inflected infinitives, subjunctives, indicatives) can be classified by the feature specifications of the two clausal heads, I and C. The relevant features are [±T] and [±Agr]. [+Agr] signifies overt morphological agreement and [–Agr] "abstract" agreement (e.g., in infinitives). Crucially, [+T] signifies *semantic* tense in the complement, which may or may not be associated with overt tense morphology. [–T] signifies the absence of semantic tense; the embedded tense is anaphoric to (identical with) the matrix tense. The standard test is the possibility of a temporal mismatch between the matrix and the embedded event.

(136) a. * Last night, Tom condescended to help us today.
→ infinitive is [–T]

b. Last night, Tom planned to help us today.
→ infinitive is [+T]

The distribution of these features on I and C follows from general principles. The value of [T] on I is interpretable, reflecting the "tenseness" of the clause. If that value is selected by the matrix verb (as in (136)), C will bear a matching [T] value, to locally mediate the selection. The choice of (abstract) [Agr] on C is subject to some variations, which are needed to distinguish between obviative and non-obviative subjunctives. In Section 4.1 we return to examine the crosslinguistic typology of complements that is covered by the model. It is important to note that *mood*, as a primitive grammatical category, plays no role in the Agree system; its alleged effects are reduced to the more basic features [T] and [Agr]. As discussed in Section 4.1, this seems sufficient for European languages (Landau 2004, 2006) but possibly not for Korean, where embedded mood markers play a key role in determining the control status of the complement.

Alongside the classification of complements, the Agree model distinguishes referentially dependent elements, [–R], such as PRO (and possibly other anaphors) from referentially independent elements, [+R], such as lexical DPs and *pro*. Uninterpretable variants of [R] occur on I and C according to the following rule.[11]

(137) *R-assignment rule*
a. [+T,+Agr] → [+T,+Agr,+R]
b. [αT,βAgr] → [αT,βAgr,–R] if either α or β is '–'

The rule only applies if both [T] and [Agr] are specified. If they are both positive, [+R] is assigned; elsewhere, [–R] is assigned. If either [T] or [Agr] is absent (as in certain "defective" clauses, like raising and small clauses), the rule does not apply.

The derivational interaction between the inherent [R] values on DPs and the derivative [R] values on I and C determines the control status of the clause. Thus, I or C which is subject to (137a) requires a local DP/*pro* subject, to check off its [+R]; I or C which is subject to (137b) requires a local PRO subject, to check off its [–R]. The interesting generalization that emerges is that "fully specified clauses" – typically, indicatives – would never exhibit OC, but any type of "partially specified" clause might. This reverses the traditional view, by which PRO-environments form a natural class defined by a single syntactic criterion (e.g., ungoverned, null case, no case etc.). (137) amounts to claiming that DP/*pro*-environments are the natural class, and PRO occurs in the elsewhere case: [+T,–Agr], [–Agr,+T] or [–T,–Agr]. Note that this distributional account of PRO "skips" the classical "middlemen" – government and case (see Section 4.2 for evidence that PRO bears case).

As to the possibility of partial control (PC), it is assumed that Agree may target either the embedded PRO (specifically, its [Agr] bundle) or the [Agr] bundle on the embedded C, if there is one. By assumption, control infinitives are weak phases, hence the former option does not violate the Phase Impenetrability Condition of Chomsky (2000, 2001). In PC, control proceeds via C. The mismatching feature of PRO in PC is [semantic plurality], which is not represented at C at all. Thus, mediation of control by C allows the controller and PRO to differ on just this feature. An empirical summary of PC is presented in Section 5.4. Recent work on case transmission in Russian (Landau 2008), together with classical work on this phenomenon in Icelandic, provides independent evidence for the existence of these two routes of control. That is,

[11] The idea that I/C might bear a [–R] feature obviously echoes Borer's (1989) theory of anaphoric Agr. Technically, however, the features of I/C cannot participate in binding (but can participate in Agree), being uninterpretable.

the case borne by PRO depends on whether it formed a direct Agree relation with the matrix probe or only an indirect one, via C (see Section 4.2).

The Agree model faces problems in the following areas. First, its reliance on elaborate feature specifications is not always perfectly matched by overt morphology (e.g., the [Agr] value of C is not directly visible). Second, like most other theories of control (with the exception of the A-movement theory), it cannot handle backward and copy control (see Section 4.3.2). Nor can it explain split control (see Section 5.3) – a sore thumb for all theories. Finally, one may object to the exclusion of adjunct OC from this model, given that at least some adjuncts bear the OC signature (see Chapter 7). The weight of this objection depends on the ultimate analysis of these adjuncts, which may well reduce to predication, and whether complement OC and predication can be unified despite the problems noted in Section 2.1.

*Further reading*

For relevant works on the topic of Section 2.5, see Landau 2000, 2004, 2006, 2007, 2008, Tóth 2000, Sitaridou 2002, Cornilescu 2003, Adler 2006, Bondaruk 2006, Ussery 2008, Sundaresan and McFadden 2009, Sundaresan 2010, van Urk 2011, Herbeck 2011.

# 3 Empirical arguments for PRO

In any domain of inquiry where theoretical proposals abound, it is useful to distinguish empirical claims that are relatively theory-neutral from those that are tightly linked to specific theories. Consider the major split between theories that deny the understood subject of infinitives any syntactic status (as in Section 2.1) from those that posit some form of a null subject (whatever its ultimate analysis is – PRO, *pro*, anaphor, trace etc.).[1] Are there any reliable theory-neutral arguments for the existence of a null syntactic subject? In this chapter we will see that there are such arguments, although they must be constructed with care.[2]

Such arguments often take the following form. Suppose we establish a generalization G that refers to lexical (i.e. overt) subjects. Suppose further that we show G to be truly syntactic, i.e., irreducible to ulterior concepts (e.g., thematic prominence, semantic recoverability, discourse salience etc.). Now we turn to control infinitives and check whether G holds in them. If it does, we have produced a pretty solid argument for the existence of PRO. The disjunctive alternative, always to be disfavored, is that G refers *either* to syntactic subjects (namely, overt subjects) *or* to nonsyntactic subjects (namely, the understood subjects of infinitives).

In fact, one finds an argument for PRO following this logic already in Jespersen 1924: 143. In a perceptive passage on the *nexus* (= roughly, predication; the *primary* is the subject) of infinitives, Jespersen writes:

[1] The denial of a null syntactic subject in control infinitives is not limited to pre-GB and predicational approaches (see Brame 1976, Bresnan 1978, Bach 1979, Chierchia 1984, Dowty 1985, Culicover and Wilkins 1986, Evers 1988, Jacobson 1992). Three recent analyses (Manzini and Roussou 2000, Roussou 2009, Herbeck 2011) reduce the embedded subject to either a θ-feature on the embedded predicate, a D-feature or a [–R(eferential)] feature on the infinitival *to*. Arguably, neither one is sufficient to account for the syntactic visibility (and the referential content) of the embedded subject. For other implementations of PRO-less OC, see Jackendoff and Culicover 2003 and Janke 2008.

[2] Most of the arguments in this chapter do not distinguish between the different syntactic options and are designed to favor *any* of them over nonsyntactic alternatives. For ease of exposition, though, I will refer to all of them as "arguments for PRO." Where the argument in the text *specifically* motivates PRO (as opposed to *pro* or trace), this will be made explicit.

Nor are these the only instances in which the primary of a nexus is left unexpressed, for in the great majority of cases in which we use either an infinitive or a nexus-substantive there is no necessity expressly to indicate who or what is the subject of the nexus. This may be either definite, as shown by the actual context, as in: *I like to travel*, or *I like travelling*, (the unexpressed primary is *I*); *it amused her to tease him* (the primary is *she*) . . . or else it may be the indefinite "generic person" (French *on*): *To travel / Travelling is not easy nowadays* . . . That the primary, though not expressed, is present to the mind is shown by the possibility of using a "reflexive" pronoun, i.e., one indicating identity of subject and object . . . *To deceive oneself / Control of oneself.*

Later on Jespersen objects to the definition of the infinitive (common in his days) as that form of the verb which is not predicated of any subject. He insists on the reality of that subject in the predicative relation itself, and, quite like a modern syntactician, provides syntactic evidence: the unexpressed subject can bind anaphors.[3]

In this section, we will see that there is abundant evidence for the syntactic presence of PRO – evidence that is fairly theory-neutral. The arguments fall into two categories: direct arguments for PRO, and direct arguments for a clausal analysis of infinitives. Note that if control infinitives were bare VPs, as the popular view in the 1970s held, then they might well be subjectless categories. If, however, they are clausal (TPs or CPs), then the only way for them to be subjectless is to allow TPs with empty specifiers – an assumption widely rejected, either on the basis of the EPP or on the basis of economy of projection.[4] Thus, a direct argument for a clausal analysis of infinitives readily translates into an indirect argument for a null subject in infinitives, PRO. Section 3.1 presents these indirect arguments while Section 3.2 turns to direct evidence for PRO.

### 3.1 Infinitives are clausal (hence, contain a subject)

There are a number of observations that follow automatically from the clausal analysis of infinitives (see Koster and May 1982 for systematic discussion).

First, control infinitives may be introduced by standard elements of COMP – specifically, complementizers and *wh*-phrases. *Wh*-infinitives (138a) are common across languages; infinitival complementizers (138b–138c) are found in Romance languages (Kayne 1981, Rizzi 1997), Dutch (Koster 1984), Scandinavian languages (Thráinsson 1993), Welsh (Borsley 1986, Tallerman 1998), Hebrew (Landau 2002) etc.

[3] One may even find the distinction between OC and NOC in its embryonic form here: the "definite" subject of a complement clause illustrates OC while the "indefinite" subject of a subject clause illustrates NOC.

[4] An exceptional proposal is put forward in Janke 2008, where it is claimed that OC clauses are CPs without a structural subject.

(138) a. Mary asked **which way** to go

b. John probeerde [**om** het boek te lezen]. *Dutch*
John tried COMP the book to read
'John tried to read the book.'

c. Gil nimna **me**-le'ašen sigaryot. *Hebrew*
Gil refrain from-to.smoke cigarettes
'Gil refrains from smoking cigarettes.'

While certain authors' conception of OC is narrow enough to classify these examples under NOC, we have argued against such a move in Sections 1.3–1.4; the examples clearly bear the OC signature. Alternatively, one might expand the grammar to include interrogative VPs and direct selectional relations between complementizers and VPs, and add special statements to the effect that that these options would be restricted to *non*finite VPs. In practice, such moves would highly complicate a perfectly natural system wherein COMP elements are merged above TP (regardless of finiteness), hence implicate a clausal projection.

Languages with a rich system of clause-typing make the CP status of OC complements more evident. The following Korean example ((139) from Lee 2009: 156) features the imperative mood marker *la* and the complementizer *ko* in the complement, as well as a fronted contrastive topic (the object marked by *-man*).

(139) Mina-ka Pata-eykey$_i$ [Con-man PRO$_{i/*j}$ manna-la-ko]
Mina.NOM Pata.DAT John-only meet-IMP-COMP
seltukha-yess-ta.
persuade-PAST-DECL
'Mina persuaded Pata to meet only John.'

Second, control infinitives can be conjoined with indisputable clauses. While conjunction of predicates need not respect categorial matching, conjunction of arguments normally does. The well-formedness of the following examples thus indicates that infinitives project to the clausal level (Koster and May 1982).

(140) a. To write a novel and for the world to give it critical acclaim is John's dream.
b. John expected to write a novel but that it would be a critical disaster.

Third, as is well known, VP-ellipsis in English strands elements of Aux/T. Standardly, Aux/T is considered to be dominated by a clausal projection. In this light, it is significant that VP-ellipsis in infinitives strands the marker *to*.

(141) a. She didn't hope that Brian would recover soon, but we did __.
b. She didn't hope to recover soon, but we hoped to __.

A maximally simple account of this parallelism would take the infinitival marker *to* to be an element of T as well (hence, outside the scope of VP-ellipsis). But this would imply that infinitives are clausal.[5]

Finally, quite a few languages (e.g., Balkan languages, Hebrew, Arabic, Dogrib, Kannada, Persian) evince OC into finite complements, typically subjunctive. These complements are unquestionably clausal, containing normal functional material which is projected above VP, like overt inflection, auxiliaries, negation and mood markers (see Section 4.1). At least for them a clausal analysis is inescapable.

## 3.2 Syntactic evidence for PRO

At least eight types of phenomena point to the syntactic presence of a null subject in control infinitives: secondary predication, floating quantifiers, agreement, case concord, binding effects, partial control, overt controllees and expletive constructions. We will consider them in turn.

Secondary predicates require an overt DP to be predicated of. As shown below, implicit objects and implicit agents of passive are not sufficient (for versions of this argument, see Koster and May 1982, Chomsky 1986, Safir 1987, 1991, Landau 2010a).

(142) a. John ate (the meat).
b. John ate *(the meat) raw.
c. He served dinner angry at the guests.
d. * Dinner was served angry at the guests.

Quite clearly, secondary predicates are acceptable inside control infinitives. This would be mysterious if the understood subject of the infinitive were merely

[5] Koster and May (1982) present two other arguments that are less convincing. First, they claim that the VP-analysis of infinitives cannot explain why control verbs do not take *finite* VPs as complements (**John decided (that) left town*). This property, however, seems to be orthogonal to the debate. Any theory must countenance selectional restrictions that go below the category label; e.g., the verb *long* takes a *for*-complement but not a *that*-complement, although both are CPs. In fact, quite a few verbs select *only* control infinitives and not finite clauses (*dare*, *condescend*, *decline* etc.), and this does not necessarily show those infinitival complements not to be clausal.

Second, Koster and May point out that clauses (i) but not VPs (ii) undergo pseudoclefting, and control infinitives pattern with the former (iii). The last claim, however, is quite inaccurate; many control infinitives fail to function as the focus of pseudoclefts (iv)–(v), a property that is possibly related to case (see Landau 2000: 87–88).

(i) What he wanted was for Bill to see Monument Valley.
(ii) * What he wanted for Bill was to see Monument Valley.
(iii) What he wanted was to see Monument Valley.
(iv) * What he dared was to visit Monument Valley.
(v) * What he convinced Jane was to visit Monument Valley.

an implicit argument, present lexically but not syntactically. By contrast, a syntactic PRO could serve as the subject of these predicates.

(143) a. The meat was too chewy [PRO to be eaten raw].
b. [PRO to serve dinner angry at the guests] is bad manners.

Can embedded secondary predicates, then, apply directly to the controller, without the mediation of PRO? This solution (essentially adopted in Janke 2008) is not general enough, for the well-known reason that secondary predicates cannot modify prepositional objects, and yet many object controllers are embedded in such PPs.

(144) a. * John pleaded [with $\text{Mary}_i$] $\text{cheerful}_i$.
[cannot mean that Mary was cheerful]
b. John pleaded [with $\text{Mary}_i$] [$\text{PRO}_i$ to arrive cheerful].

Without PRO, it is unclear what makes *Mary* a possible argument of *cheerful* in (144b) but not in (144a).

A similar pattern emerges with floating quantifiers (FQ): the argument associated with them must be syntactically overt. Thus, the implicit agent of the passive in (145b) cannot license the FQ, but PRO in (145c–145d) can.

(145) a. They have all gained something.
b. * Something has all been gained.
c. They wanted [PRO to all gain something].
d. [PRO to all gain something], they knew, would be a miracle.

Plural agreement is likewise dependent on the presence of an overt DP which is syntactically plural (146). Note that semantic plurality alone is insufficient (in American English, though it is in British English).

(146) a. * John hoped that his uncle would be partners.
b. * This group is/are partners.

In situations of split control (see Section 5.1), the understood subject of the infinitive is jointly controlled by the matrix subject and object. The fact that plural agreement is licensed in the infinitive strongly suggests that this subject is syntactically present, as there is no other plural DP to license the agreement.

(147) $\text{John}_i$ proposed to his $\text{uncle}_j$ [$\text{PRO}_{i+j}$ to be partners].

Note further that the null subject here cannot be a trace or an anaphor (rather than a logophor), as neither one accepts split antecedents.

A special kind of infinitive-internal agreement that has attracted a lot of attention is case concord (see Section 4.2). In languages like Russian and Icelandic, not only arguments but also (NP and AP) predicates bear case. Case concord simply describes the common situation where the case on the predicate

agrees with the case on the DP of which it is predicated (the other option is for the predicate to bear default case). Of special interest are situations where the case of a predicate inside a control infinitive is distinct from the case of the controller.

(148) a. *Russian*
Ona poprosila ego ne ezdit' tuda odnomu zavtra.
she.NOM asked him.**ACC** not to-go there alone.DAT tomorrow
'She asked him not to go there alone tomorrow.'

b. *Icelandic*
Ólaf hafði ekki gaman af að vanta einan í veisluna.
Olaf.**NOM** had not pleasure of to lack alone.**ACC** to party.the
'Olaf didn't find it pleasurable to be absent alone from the party.'

As Andrews (1976) was the first to point out, such facts are inexplicable on the VP analysis of infinitives (see Comrie 1974 for a similar conclusion).[6] Unlike situations of "case transmission," where the embedded predicate agrees with the controller in case, in (148) their cases are independent. A straightforward account of these facts would attribute the case of the secondary predicate to concord with the case of the controlled subject PRO. In Russian, the case locally assigned to PRO is dative. In Icelandic, it is nominative, but this case may be overridden by the quirky case associated with the embedded primary predicate (accusative in (148b)). Since neither dative nor accusative are the default cases of Russian and Icelandic, an account without PRO would be hard pressed to explain why just these cases show up on the secondary predicates in (148a–148b).[7] An account with PRO simply avails itself of the standard clause-bound process of case concord, which is responsible for case-marking of predicates in general.

Turning to binding effects, arguments for PRO capitalize on the claim that certain obligatory coreference and disjoint reference effects in infinitives cannot be explained without appealing to a hidden, unpronounced subject. It is worth noting that such arguments are not entirely trivial to make. Consider the fact that *herself* must refer to PRO in (149a) and that *him* must be disjoint from *John* in (149b).

[6] See Landau 2006, 2008 for extensive empirical and theoretical discussion, and Landau 2003, Bobaljik and Landau 2009 for the implications of these data for the movement theory of control (Section 4.2 below).

[7] Such an account is, in fact, developed in Janke 2008. In her account, quirky case on embedded predicates is directly assigned by the verb (and not via concord with PRO), while nominative case is not assigned at all, being, in truth, simply "no case." Even ignoring Sigurðsson's (1991, 2002, 2008) arguments that nominative in Icelandic is a genuine, structural case, Janke's proposal fails to extend to Russian, where the structural case assigned inside infinitives is dative, not nominative. Furthermore, in the absence of PRO, Janke must explain the source of ϕ-feature agreement on secondary predicates in control infinitives. For this she invokes a second, discourse process of agreement, operating outside syntax. Thus the purported gains in ridding the grammar of PRO are nullified by additional complications elsewhere.

(149) a. $\text{Mary}_i$ planned [$\text{PRO}_i$ to buy $\text{herself}_{i/*j}$ a new coat].
b. Vivian convinced $\text{him}_{i/*j}$ [$\text{PRO}_i$ to forgive $\text{John's}_j$ cousin].

These facts cannot be cited in support of the existence of PRO (as in Postal 1970), because they follow equally smoothly from the same binding theory (i.e., the same conditions A and C) coupled with PRO-less structures for the infinitives. Without PRO, the binding domain for the anaphor in (149a) would extend to the matrix clause, where the controller *Mary* can function as the direct binder (see Brame 1976: 113). And obviously, the controller *him* in (149b) c-commands *John* no less than PRO does.

Harder to dismiss are examples of anaphor binding inside NOC infinitives and gerunds, where there is either no explicit controller (150a) or one which is outside the binding domain (150b).

(150) a. [$\text{PRO}_i$ behaving $\text{oneself}_i$ in restaurants] would be necessary.
b. $\text{Mary}_i$ realized that it would be useless [$\text{PRO}_i$ to nominate $\text{herself}_i$ for the job].

Here, the only potential binder for the anaphor is PRO. In fact, similar examples can be constructed with OC infinitives, as long as one guarantees that the matrix controller is not a potential binder. In Russian, the possessive anaphor *svoj* is subject-oriented, meaning it cannot be bound by objects of any sort. The fact that it *appears* to be bound by the matrix object in (151a), then, can be easily explained if the actual binder is a subject, namely the embedded PRO (which is controlled by the matrix object). Likewise, German *sich* cannot be bound by dative arguments. It being licitly bound in (151b) therefore implies a PRO binder in the infinitive (Wurmbrand 2001: 234).

(151) a. John ubedil $\text{Mary}_i$ [$\text{PRO}_i$ navestit $\text{svoju}_i$ sestru]. *Russian*
John persuaded Mary to.visit SELF's sister
'John persuaded Mary to visit her own sister.'

b. Sie hat dem $\text{Hans}_i$ erlaubt [$\text{PRO}_i$ $\text{sich}_i$ den Fisch *German*
She has the.DAT John allowed SELF the.ACC fish
mit Streifen vorzustellen].
with stripes to.imagine
'She allowed John to imagine what the fish would look like with stripes.'

For this argument to be entirely compelling, however, we must be sure that anaphors cannot be bound by implicit arguments (namely, arguments that are not represented in the syntax). Otherwise, one would be able to locate the binder in (150)–(151) in lexical or conceptual structure, voiding the case for a syntactic PRO (see Williams 1987, 1994). There is, in fact, good evidence from binding-control contrasts, suggesting that while implicit arguments are visible qua controllers, they are not visible qua binders of anaphors (Rizzi 1986a, Landau 2010a). In the examples below, the implicit goal of the the verbs *give* and *talk* cannot bind the anaphor.

(152) a. * Lo psichiatra ha restituito se stessi/noi stessi. *Italian*
the psychiatrist has given.back themselves/ourselves
'The psychiatrist gave back themselves/ourselves.'

b. They$_i$ remembered that John talked *(to them$_i$) about each other's plans.

An even stronger case for PRO – arguably, one of the strongest arguments in general – can be made on the basis of the following pair (Koster and May 1982).

(153) a. * John talked with Mary about each other.
b. John$_i$ proposed to Mary$_j$ [PRO$_{i+j}$ to help each other$_{i+j}$].

Reciprocal elements do not allow split antecedents, as (153a) shows. Nevertheless, they are grammatically bound in (153b), where the antecedents appear to be split in the matrix clause. The anomaly is removed once we allow for PRO to be split-controlled, as in (147), supplying the reciprocal with a unitary plural binder. Once again, neither a trace nor an anaphor accepts a split antecedent, so this argument selectively motivates a PRO analysis. Giorgi and Longobardi (1991: 178, 262: fn. 2) reproduce exactly the same argument on the basis of Italian data.

Superficially, the arguments from predication, FQs and binding might be taken to reveal something about the semantic interpretation of control constructions. In truth, however, they are narrowly syntactic. In Janke 2008, where a PRO-less theory of control is developed, it is claimed that secondary predicates, FQs and anaphors are all licensed by the external θ-role of the infinitive, which is identified with the θ-role of the controller. This thematic approach, however, will not do; the point of examples (142b, 142d), (145b) and (152) is precisely to show the inability of implicit arguments – which are indistinguishable from overt arguments *qua θ-roles* – to license such elements. Moreover, the mediation of PRO is necessary to allow secondary predicates and to allow subject-oriented anaphors under oblique controllers ((144), (151)).

Consider next condition C effects. These also point to the presence of PRO, as in (154a), a famous example from Ross 1969;[8] likewise, condition B effects (154b).

(154) a. [PRO$_{j/*i}$ realizing that Oscar$_i$ was unpopular] didn't disturb him.
b. John$_i$ reminded us that [PRO$_{arb/*i}$ to push him$_i$ any further] would be useless.

[8] Ross marked this sentence as ungrammatical with *Oscar* and *him* coindexed. This is true only on the dominant reading, in which *him* controls the PRO subject of *realizing*. If the realizer is distinct from *him*, the sentence is grammatical, but only on the reading where the realizer is also distinct from *Oscar* (due to condition C); see also Chomsky 1986: 168.

Note that at least for condition C, the disjointness effect is non-local, hence not within the realm of lexical relations, which are confined to a single argument structure. If implicit arguments are lexically represented and null arguments are syntactic, then (154a) indicates that the long-distance binder of *Oscar* must be of the latter type; hence, we have another argument for PRO (Landau 2010b).

Let us turn now to a special type of control that further attests to the presence of a syntactic subject in the infinitive. The phenomenon is partial control, which arises when the controlled subject properly includes the controller (Landau 2000).

(155) a. The organizer decided [PRO to meet right before the parade].
b. John felt sorry that Mary regretted [PRO kissing the night before].

In Section 5.2 we return to examine partial control more closely. The present point, however, is quite simple. Predicates like intransitive *meet* and *kiss* require a semantically plural subject in order to be licensed (**The organizer met / *Mary kissed*), and yet they freely occur under a controller in the singular. Just as in the case of reciprocal binding (153b), positing PRO (but not a trace) to mediate this relation solves the puzzle; the local subject of the infinitive is a semantically plural PRO, which is partially controlled by the matrix argument.[9]

A further piece of straightforward evidence for the syntactic presence of the controlled subject is the fact that in certain languages and constructions, this subject surfaces overtly: either as a bound pronoun or reflexive, or as a full copy of the controller. There is solid evidence that these constructions possess the OC signature, except for the unusual property that the controlled position is spelled out. If anything, pronominal, copy and backward control prove that controlled clauses contain syntactic subjects. Overt controlled pronouns were already discussed in (67b)/(71b) above; I defer the full discussion of the relevant data to Section 4.4 below.

The final argument for a syntactic PRO involves expletive constructions and is due to Chomsky 1981: 327 (see also Jaeggli and Safir 1989). Observe first that expletive *it* may freely occur as an embedded subject.

(156) a. For it to be obvious that Bill is lying would be a shame.
b. It is illegal for it to be required that we wear helmets in class.

[9] Admittedly, purely semantic approaches to OC that dispense with PRO might contemplate a meaning postulate achieving the effect of partial control outside of syntax. As argued in Landau 2010b, this would incur a great theoretical cost. Interestingly, there is independent evidence from case concord that partial control is syntactically mediated. In Russian, simple subject control predicates impose case transmission (into the infinitive) but when the control relation is partial, case transmission is blocked and an independent dative case emerges in the infinitive (Landau 2008; see Section 5.2 below).

The matrix predicates in (157) also take control clauses with arbitrary subjects.

(157) a. [PRO to lie] would be a shame.
b. It is illegal [PRO to wear helmets in class].

Crucially, though, PRO is not allowed to replace the expletive in (156).

(158) a. * [PRO to be obvious that Bill is lying] would be a shame.
b. * It is illegal [PRO to be required that we wear helmets in class].

The ungrammaticality of (158) indicates that PRO in NOC contexts is subject to certain interpretive restrictions. These restrictions are, in fact, quite complex, and we discuss them at length in Chapter 6. For present purposes, it suffices to note that NOC PRO must be [+human]. However, whatever interpretive condition one imposes on NOC PRO, it is impossible to state without presupposing the existence of PRO! Clearly, the presence of PRO in (158) is not required by semantic coherence, since it occurs in a nonthematic position. If the infinitives in (158) had been allowed to project without a syntactic subject, no grammatical condition would have been at stake. Thus, these sentences demonstrate three points at the same time: (i) clauses must have structural subjects (the EPP); (ii) PRO cannot be an expletive; (iii) PRO exists. It is hard to see how a PRO-less approach would be able to rule out (158) without recourse to auxiliary assumptions. Moreover, the missing null subject in these sentential subjects cannot be a simple pronoun (*pro*) (as in Bouchard 1984, Koster 1984, Hornstein 1999, 2003, Boeckx and Hornstein 2007), given that expletive pronouns are common.

# 4 Predicting the distribution of PRO

In Chapter 2 we have surveyed the main theoretical approaches in generative grammar to control. Each approach makes different claims about the two central questions of control: the distribution of PRO and its interpretation. In this section we shift from theories to empirical descriptions, focusing on the issue of distribution. The interpretive issues are discussed in Chapter 5.

The distribution of control is a hard, multi-faceted topic. We have already explored one aspect of the topic – the configurational distinction between OC environments and NOC environments (see Section 1.5). Generalization (96), repeated below, governs the external distribution of PRO (or more precisely, control clauses).

(159) *Configurational effects on control*
Complement clauses fall under OC; subject and adjoined (extraposed) clauses fall under NOC.

What is now needed is an understanding of the *internal* distribution of PRO. That is, what grammatical factors internal to a given clause determine whether it licenses PRO or a lexical NP, and what syntactic positions are open to PRO.

The internal distribution of PRO breaks into three interrelated questions.

(160) *The internal distribution of PRO*
a. Finiteness ingredients: How does finiteness interact with control? Is the presence of PRO linked to a specific mood, tense or agreement – or to their absence? Tightly connected is the question of whether PRO bears case.
b. Subjecthood of PRO: Is PRO necessarily a subject? If so, why?
c. Nullness of PRO: Is PRO necessarily null? If so, why?

Section 4.1 discusses the interaction of control and finiteness and Section 4.2 presents crosslinguistic evidence for case-marking of PRO. Section 4.3 addresses the subjecthood property and Section 4.4 the nullness property. In all these respects, we will see that the traditional answers (deriving from English-centered studies) are incorrect. Thus, OC may apply to finite complements,

PRO may bear case, be lexically realized, and possibly, it need not occupy the subject position. On the methodological side, this section demonstrates the indispensible value of comparative empirical studies to the formulation of viable theories of UG.

## 4.1 Finiteness ingredients

### *4.1.1 The naive years (only nonfinite control)*

The earliest account of control – the Equi-NP Deletion rule of Rosenbaum (1967) – stipulated that the output form of the embedded verb was nonfinite (infinitive or gerund). This was intended to distinguish (161a) from (161b) in English.

(161) a. John expected to win.
b. * John expected (that) would win.

That is, controlled clauses are never finite. It is somewhat surprising to see how little theoretical attention this observation received during that time. The nonfiniteness of the output form was simply part of the description of the rule – not part of the problem to be explained. It seems that Postal (1970: fn. 25) was the first to realize the non-trivial nature of this problem, but even he did not raise the question whether control and finiteness are correlated in all languages as they are in English. The underlying assumption (in the absence of crosslinguistic data) was that they are.

This assumption carried through to Chomsky 1973, where general principles were introduced to derive the correlation for the first time. The Tensed-S Condition made finite clauses opaque to any dependency with matrix elements, and the Specified Subject Condition further restricted such dependencies to nothing below the embedded subject. Chomsky and Lasnik (1977: fn. 30) put it as follows:

> This property of control follows from the Tensed-S Condition (which blocks any anaphoric relation between an anaphor in a tensed sentence and an antecedent outside it) and the Specified Subject Condition (which permits only the subject of an embedded sentence or NP to be related anaphorically to an antecedent outside) . . . Therefore, from these conditions, which are quite independently motivated, it follows that only the subject of an infinitive or gerund is susceptible to control.

Within GB, the nonfiniteness of controlled clauses was guaranteed by a conjunction of assumptions and stipulations, which became known as the "PRO theorem" (Chomsky 1981: 191).

(162) *The PRO theorem*
a. PRO is [+anaphoric,+pronominal].
b. ⇒ PRO is subject to binding conditions A and B simultaneously.[1]
c. PRO has no governing category (otherwise, (b) entails a contradiction).
d. PRO has no governor, i.e., PRO is ungoverned.

"Government" itself received numerous definitions. For our purposes it is sufficient to point out that all these definitions had the effect of setting nonfinite I apart from finite I and other lexical heads. Specifically, only lexical heads and finite I (i.e., I containing [Agr]) are potential governors; nonfinite I is not, by stipulation.

This conclusion, coupled with the distributional law of PRO (162d), predicted that PRO will only be able to occur (at S-structure) as the specifier of nonfinite I and nowhere else; in all other positions it would be governed and hence induce a binding theory contradiction. Needless to say, this account of PRO's distribution, as well as the counterintuitive assumption (162a), have met with much criticism (Bresnan 1982, Mohanan 1982, Bouchard 1984, Koster 1984).

An ingenious modification of the PRO-theorem account is offered in Kayne 1991. Kayne noted that the binding theory of Chomsky (1986) introduced a discrepancy between the GCs of anaphors and pronouns in an internally governed subject position. Specifically, since the subject anaphor has no chance to be bound in its minimal NP/IP, its GC extends to the next category up containing a subject. A subject pronoun, however, can satisfy condition B in its minimal NP/IP, hence its GC is smaller. In this scenario, joint satisfaction of conditions A and B does not produce a contradiction: PRO will be governed by some inflectional head, free in its "pronominal GC" (the infinitive clause) and bound – by the controller – in its "anaphoric GC," the matrix clause.

This formulation allows Kayne to capture a rather striking crosslinguistic correlation. Consider first the fact that the English interrogative complementizer *if* is incompatible with infinitives.

(163) a. He doesn't know whether he should go to the movies / to go to the movies.
b. He doesn't know if he should go to the movies / *to go to the movies

The standard assumption is that *whether* is a *wh*-phrase in Spec,CP and *if* is a C head. The contrast between the grammatical structure [$_{CP}$ *whether* [$_{C'}$ Ø [$_{IP}$ PRO . . . ]]] and the ungrammatical structure *[$_{CP}$ [$_{C'}$ *if* [$_{IP}$ PRO . . . ]]] is explained if a null complementizer is not, but a lexical complementizer is a governor for PRO (a specifier is never a governor). Since PRO is governed from

[1] Condition A: an anaphor must be bound in its GC (governing category).
Condition B: a pronoun must be free in its GC.
GC of α (simplified): the minimal category containing α, a subject and a governor for α.

the outside, the GC cannot be the embedded IP. Hence, both the pronominal and the anaphoric GCs are the matrix clause – a binding-theoretic contradiction.

Next Kayne observed that the ban on an *if*-PRO sequence is respected in some Romance languages but not in others; and whether or not it is respected correlates with the order of the infinitival verb and its clitic, as follows.

(164) *Kayne's* 'if '*-PRO generalization*
*if*-PRO is grammatical if $V_{INF}$ precedes its clitics.

As documented in Pollock 1989, verb movement in infinitives is sometimes "shorter" than it is in finite clauses. If the verb does not move to the highest inflectional head, it will follow pronominal clitics; if it does move to the highest head, it will precede them. French and Italian contrast in this way.

(165) a. Lui parler serait une erreur. *French*: Cl-$V_{INF}$
him.DAT to.speak would.be an error
'To speak to him would be an error.'

b. * Parler-lui serait une erreur.

(166) a. Parlar-gli sarebbe un errore. *Italian*: $V_{INF}$-Cl
to.speak-him.DAT would.be an error
'To speak to him would be an error.'

b. * Gli parlar sarebbe un errore.

In accordance with (164), *if*-PRO is possible in Italian (167b) but not in French (167a) (Kayne shows by various tests that *si*/*se* are genuine complementizers).

(167) a. * Marie ne sait pas si PRO aller au cinéma (ou non).
Mary NEG knows not if to.go to.the cinema (or not)
'Mary doesn't know whether to go the cinema or not.'

b. Gianni non sa se PRO andare al cinema.
Gianni NEG knows if to.go to.the cinema
'Gianni doesn't know whether to go to the cinema.'

Like French are Occitan, Sardinian and the Italian dialect of Gardenese. Like Italian are Catalan, Spanish, and various Italian dialects (Piedmontese, Milanese, Paduan). All these languages conform to (164).

Kayne's idea is that in Italian-type languages, the infinitival verb moves to a high position (above the clitic); specifically, it adjoins to I', a position from which it governs PRO. The French infinitival verb, in contrast, moves to a low position (below the clitic) from which it does not govern PRO.

Because the Italian PRO is governed already within the embedded IP in (167b), its pronominal and anaphoric GCs differ just in the way allowed in Chomsky's (1986) binding theory. Moreover, since the anaphoric feature must be bound in the matrix clause, Kayne derives the locality of OC as in other

binding approaches to OC (Manzini 1983, Koster 1984).[2] The French PRO in (167a) is only governed by *si* in C, hence its two GCs converge on the matrix clause, producing ungrammaticality, as in the English (163b).

Current theoretical assumptions make it difficult to maintain Kayne's original explanation. In particular, government is no longer a credible syntactic relation, hence cannot enter the definition of binding domains. Yet Kayne's generalization (164), as well as the striking contrast in (163), are lingering challenges to theories of control; except for Martin (1996), who revisited these facts, they have been kept in oblivion.

Martin's (1996) starting point is a distinction between "OC verbs" (e.g., *try*, *persuade*) and "NOC verbs" (e.g., *promise*, *ask*), which is based on the possible occurrence of the latter, but not the former, with *for*-infinitive complements. This distinction is inherited from Williams 1980 and Bresnan 1982, and is quite problematic (see Manzini 1983, Landau 2000: 31–33). Next, Martin analyzes PRO in OC as (a null version of) a SE anaphor of the Romance type. DPs must be grammatically *R-marked* for the purpose of referential distinctness, which is normally achieved by case-marking. The special "null case," however, which is assigned to PRO (Chomsky and Lasnik 1993; see more below), is not associated with any ϕ-features, hence it fails to R-mark it. Thus PRO, like SE anaphors in general, cliticizes to the matrix T, where it forms a "collapsed chain" with the controller, thereby being licitly R-marked.

Importantly, cliticization of PRO is a species of head movement. Thus the contrast in (163) is derived with no recourse to government: a lexical C blocks cliticization of PRO into the matrix clause (by relativized minimality) but a lexical specifier does not.

As to the crosslinguistic correlation with $V_{INF}$-raising, stated in (164), Martin proposes that "NOC complements" (recall that this sense of NOC is different from the standard sense, which is the topic of Chapter 7) license PRO internally. In particular, the TP complement is embedded under a "point of view" head, F, which encodes the [person] feature of the controller DP. This feature allows PRO, which cliticizes to F inside the infinitive, to be R-marked. Assuming that F is strong in Romance languages like Italian, it attracts the infinitival verb to the leftmost position in the infinitive. Thus PRO is licensed internally to the infinitive and the presence of a lexical C is harmless, deriving Kayne's generalization in (164).[3]

[2] How is the locality of OC ensured in non-$V_{INF}$-raising languages like English and French? Kayne assumes that $V_{INF}$ also raises in these languages, only at LF. This movement cannot undo the violation of condition B at S-structure in (165b)/(167a), but *can* allow condition A to be satisfied at LF in standard OC cases; this is in line with the "anywhere" view of binding conditions (Belletti and Rizzi 1988).

[3] Martin's analysis of control raises several difficulties. First, internally to his concerns, it seems that the correlation in (164) requires external stipulations. Why do French-type languages exclude

Let us return to the issue of finiteness and control. Although criticized for being unprincipled, the GB account of the distribution of PRO was not exceptionally stipulative. Consider the LFG account. Functional control can only apply to the open functions XCOMP and XADJ. The syntactic categories that are mapped to these functions are the predicative categories – namely, those that have no "structural subjects" (Bresnan 1982: 359, 375). This allows for (161a) but still does not explain (161b): why is it that English finite clauses *must* have structural subjects? Why can't they be predicative? There is no answer.

The situation with anaphoric control is slightly better. Bresnan (1982: 380) explicitly builds two parameters into the rule of anaphoric control: one fixes the grammatical function of the controllee (SUBJ, OBJ or OBJ2) and the other one fixes the finiteness of its governor ([±FIN]). This allows for crosslinguistic variation (perhaps too much variation; whether nonsubjects can be controlled will be discussed in the next section) but forsakes the attempt of reducing it to deeper properties. Thus, the fact that English chooses the parameter values {SUBJ, [–FIN]} is simply stated, not explained.

Predicational theories of control say very little about finiteness. The common assumption, presumably, was that finite clauses are propositional and for that reason cannot be involved in OC, in which the complement must be predicative. In Chierchia 1984: 239–255, VP properties are mapped to a special kind of individual in order to be able to function as arguments. The mapping functor is the infinitival [–Agr], the marker *to* merely being an identity function. Once again, the issue of why [+Agr] cannot fulfill the same function is not addressed.

The inherent link of control to nonfiniteness persists in the two main approaches to the distribution of PRO within minimalism: the null case theory and the A-movement theory. Under the null case theory, first proposed in Chomsky and Lasnik 1993, nonfinite T and only nonfinite T assigns a special "non-lexical," or null case; the only DP that can bear that case is PRO. Subsequent refinements (Bošković 1997, Martin 2001) distinguished control T heads, specified [–Finite,+Tense], from raising/ECM T heads, specified [–Finite,–Tense]. While the former assign null case to PRO, the latter assign

*if*-PRO? One option may be that they lack the F head (hence, license PRO only by cliticization). This would leave us with no non-circular way of identifying F-projecting infinitives. Instead, Martin suggests (p. 196) that F in some languages is too "weak" to either attract the infinitival verb or R-mark PRO (although, presumably, F is always specified for [person]). A second problem is empirical: Martin claims that "NOC complements" allow mismatch in syntactic number between the controller and PRO (requiring only [person]-identity), but in reality, only mismatches in *semantic* number are tolerated; see the discussion of partial control in Section 5.2. Third, to explain the incompatibility of *for*-infinitives with PRO, Martin proposes that *for* contains a full set of φ-features, which PRO cannot check; this assumption is certainly odd, if morphology is any guide to φ-features. The postulation of null case ("disguised" as accusative in English, nominative in Portuguese etc.) raises a host of independent problems, to be discussed below.

no case (hence, only an A-trace is licit in their specifier). Note that here too, the link between control and nonfiniteness is stipulated.

Even before considering the challenge of finite control (see the next section), the null case theory raises serious, possibly insurmountable difficulties (Wurmbrand 2001: 69–70, 2011, Baltin and Barrett 2002, Hornstein 2003, McFadden 2004: Ch. 8).

First, the empirical content of [+Tense] in the null case theory is dubious. It is based on Enç's (1990) claim that eventive predicates introduce a variable that must be bound by some tense/modal operator, but stative predicates do not. Enç claimed that the English present tense is semantically vacuous, hence the familiar restriction to stative predicates. She then interpreted the fact that raising/ECM complements also reject eventive predicates as evidence for absence of a tense operator in them.

(168) a. * Mary seemed to jump over the fence.
b. * John believed Mary to jump over the fence.

Already at this stage one may wonder why the matrix [+Past] tense operator is not enough to license the event variable of the embedded predicate, assuming that there is no intervening tense operator in the infinitive.

Second, Martin himself observes that the tense of ECM complements is not identical to present tense. If it were, (169a) and (169b) would have been synonymous. In fact, while both entail that the time of Mary's sickness contains the time of proving, only the latter entails that it also contains the speech time (the *double access* reading). This implies that present tense is not semantically vacuous, after all.

(169) a. John proved Mary to be sick.
b. John proved that Mary is sick.

It follows that the exclusion of eventive predicates (e.g., **Mary jumps over the fence now*) cannot be taken as evidence for lack of tense. And if it cannot be so taken for present tense, why should it be so taken for raising/ECM tense in (168)? The ungrammaticality of eventive predicates, which is supposed to be distinctive of raising/ECM, does not really speak to the issue of tense.

Third, the eventive/stative test is not only unrelated to tense, but unrelated to the raising/ECM vs. control distinction. Counterexamples exist in both directions: Some raising/ECM predicates license eventive predicates (170a–170b), and some control complements do not (170c). Martin argues that the former are actually control variants, but this is easy to rule out, as Hornstein (2003) notes (e.g., *The shit appeared to hit the fan right then*).

(170) a. John is likely/certain to jump over the fence.
b. We expected John to jump over the fence.
c. * John claimed to jump over the fence.

Fourth, as Wurmbrand notes, ambiguous verbs, that take either raising or control complements, do not correlate this choice with tense or eventiveness of the complement.

(171) a. Bill threatened to push the vase off the shelf.
b. The vase threatened to fall off the shelf.

The complement of the raising *threaten* in (171b) is no less eventive than the complement of the control *threaten* in (171a).

Fifth, following Stowell 1982, Martin identifies [+Tense] with irrealis (future-oriented) interpretation. However, this is clearly too narrow a view of the tense of control complements, which could be also realis and propositional (Pesetsky 1991, Landau 2000). Observe the temporal mismatch between the matrix and the embedded events, indicating the presence of [+Tense] in the complement.

(172) a. Today, John regretted having kissed his aunt last week.
b. Today, John claimed to have lost his car keys last week.

Sixth, (172a) points to another problem in Martin's account, also inherited from Stowell. Stowell argued that gerundive complements are systematically [–Tense], which explains the variability in their temporal interpretation.

(173) a. * Yesterday, John avoided leaving tomorrow.
b. Yesterday, John preferred leaving tomorrow.

As noted in Landau 2007, the problem is that the same logic can be applied to minimal *infinitival* pairs, potentially voiding Stowell's claim that they do contain tense.

(174) a. * Yesterday, John managed to solve the problem tomorrow.
b. Yesterday, John hoped to solve the problem tomorrow.

Thus, the true [Tense] property (based on temporal mismatch rather than the licensing of eventive predicates) cuts across both the control/raising distinction and the gerund/infinitive distinction.[4] In fact, in the realm of gerunds, the null case approach fares even worse. As Pires (2007) pointed out, [–Tense] gerunds

[4] Duffley (2000), while accepting that gerundive complements are temporally variable, maintains that infinitival ones share a semantic core – a notion of subsequence. Thus, the infinitival event must follow the matrix event, though (unlike Stowell's proposal) it need not be unrealized. He then distinguishes between actualized and unrealized infinitives, corresponding to implicative and irrealis complements (174). This view ignores the existence of propositional infinitives like (172b) and factive ones like (i), where the infinitival event may be temporally prior to the matrix event.

i. I'm sorry to have missed your call, please forgive me.

force OC (175a–175b), whereas [+Tense] gerunds alternate between OC and no-control (175c), an alternation that does not correlate with tense. If anything, this is just the opposite of the expected pattern, if null case and PRO are linked to [+Tense].

(175) a. Philip$_i$ tried/avoided [PRO$_i$/*Jane driving in the freeway].
b. * Philip$_i$ tried/avoided last night [PRO$_i$ driving in the freeway this morning].
c. Last week, Sue favored/insisted on [PRO$_i$/Anna moving to Chicago today].

In sum, the null case approach cannot explain the distribution of PRO. Even restricting attention to nonfinite clauses, there is no stable semantic property that distinguishes control from raising complements or no-control complements. This lesson is important to bear in mind when we turn to the crosslinguistic data in the next section. It will become obvious that the determination of OC, although sensitive to [Tense], is equally sensitive to formal [Agr] features.

The other minimalist approach to the distribution of PRO is the A-movement theory (see Section 2.4). In this theory, finiteness and OC are indirectly related; the mediator is case. Following the standard GB assumption, Hornstein (1999, 2003) assumes that the defining property of the controllee's position is lack of case. The idea is that nonfinite T assigns no case to its specifier, thereby freeing it to raise and check case in the matrix clause. Note that on this theory, it is conceivable in principle to relax the connection between finiteness and case, such that certain T$_{[+Fin]}$ heads would also fail check case (cf. Boeckx and Hornstein 2006a, Ferreira 2009). The deeper question for the A-movement approach is why case should be tied to finiteness, across languages, in the ways that it is. More significantly, Section 4.3 will demonstrate that PRO in fact bears case like any other overt DP; thus, the shift from finiteness to case in the attempt to capture the distribution of PRO will prove to be counterproductive.

### *4.1.2 The crosslinguistic picture: finiteness and control*

In this section we present ample evidence that OC is possible into finite complements. This finding pulls the rug from under all the classical accounts of the distribution of PRO. One should welcome it, because so many of these accounts were mired in ad-hoc, stipulative assumptions. The discussion should also serve as a reminder of the indispensible value of comparative work in syntax. The early Anglocentric theories of control were deeply misguided precisely where they elevated parochial properties of English to the level of universals.

The existence of finite control was recognized already in the 1980s as a pervasive feature of the Balkan languages (Joseph 1983, Comorovski 1985, Philippaki-Warburton 1987, Iatridou 1988). These languages have lost the infinitive almost completely, and instead use the subjunctive, marked with a designated preverbal mood particle. OC clauses in these languages (Greek, Bulgarian, Romanian, Serbo-Croatian, Albanian) feature a present tense subjunctive form, inflected for the features of PRO. Finite control is also attested in Persian (Hashemipour 1988, Ghomeshi 2001, Darzi 2008, Karimi 2008), Dogrib (Saxon 1984, 1989), Kannada (Nadahalli 1998) and Hebrew (Borer 1989, Landau 2004, Gutman 2004, Shlonsky 2009). OC is also attested with "semi-finite" complements, i.e., complements that bear agreement but no tense morphology: inflected infinitives in Hungarian (Tóth 2000), Welsh (Tallerman 1998), Brazilian Portuguese (Modesto 2007a, 2010a, 2010b) and inflected nominalized complements in Basque (San-Martin 2004) and Turkish (Słodowicz 2007). Finally, a variety of OC complements in Korean (individuated by their mood markers) can freely occur as independent matrix sentences, a typical property of finiteness (Madigan 2008a, Lee 2009).

All in all, the phenomenon of finite control is crosslinguistically robust and certainly not exotic or marginal.

The licensing of finite control has been studied in depth in Landau 2004, 2006. The following discussion presents his main findings and generalizations, with some extensions. At the end of this section we turn to languages (like Korean) where OC is directly tied to mood.

Before we start, some clarification of the terminology and the underlying concepts is in order. The present section deals with the distinction between OC and "no control" (NC) environments, which is *different* from the distinction between OC and "non-obligatory control" (NOC) environments (in Chapter 7 we return to NOC). The difference is both configurational and interpretive. NC environments are complement clauses, NOC environments are subject and adjunct clauses; further, NC clauses host a lexical DP or *pro* as subject, whereas NOC clauses host a PRO subject which is logophoric or topic-bound. Thus, the categories NC and NOC are extensionally disjoint. The distributional logic here is two-stepped: first, internal factors (finiteness ingredients) determine whether the subject is PRO or DP/*pro*; second, for the PRO cases, configurational factors (complement vs. subject/adjunct, see Section 1.5) determine whether PRO exhibits OC or NOC.

Let us ask, then, what the finiteness determinants of OC are. The answer is: semantic tense and morphological agreement. Morphological agreement is, quite simply, visible inflection for ϕ-features. Semantic tense is detectable by the possibility of a temporal mismatch between the matrix and the embedded events; for example, the complements in (173a)/(174a) are untensed and those in (172)/(173b)/(174b) are tensed. Landau (2000) classified control

predicates into those that select untensed complements and those that select tensed complements.[5]

(176) *Predicates selecting untensed complements [–T]*

a. Implicatives
*dare, manage, make sure, bother, remember, get, see fit, condescend, avoid, forget, fail, refrain, decline, neglect, force, compel*.

b. Aspectual
*begin, start, continue, finish, stop, resume*.

c. Modal
*have, need, may, should, is able, must*.

d. Evaluative (adjectives)
*rude, silly, smart, kind, (im)polite, bold, modest, cruel, cowardly, crazy*.

(177) *Predicates selecting tensed complements [+T]*

a. Factives
*glad, sad, regret, like, dislike, hate, loathe, surprised, shocked, sorry*.

b. Propositional
*believe, think, suppose, imagine, say, claim, assert, affirm, declare, deny*.

c. Desideratives
*want, prefer, yearn, arrange, hope, afraid, refuse, agree, plan, aspire, offer, decide, mean, intend, resolve, strive, demand, promise, choose, eager, ready*.

d. Interrogatives
*wonder, ask, find out, interrogate, inquire, contemplate, deliberate, guess, grasp, understand, know, unclear*.

The overarching generalization is the following.

[5] Note that these classes are largely invariant across languages, yet mismatches exist to the extent that translations of verbs do not always preserve the original conceptual structure.

Aspectual verbs are systematically ambiguous between raising and control (Perlmutter 1970); we ignore the former variants. Implicative predicates assert (or deny) the truth of their complement (Karttunen 1971), whereas factive predicates presuppose it (Kiparsky and Kiparsky 1970). Thus, while both versions of (i) entail that John talked to Mary, the entailment is carried over only with *glad* in (ii); the *dare* version of (ii) entails that John *didn't* talk to Mary.

i. John dared / was glad to talk to Mary.
ii. John didn't dare / wasn't glad to talk to Mary.

On evaluative adjectives, see Wilkinson 1976, Stowell 1991, Bennis 2000, 2004, Barker 2002, Landau 2009, Kertz 2010.

Propositional verbs are epistemic or declarative; they are diagnosed by the possibility of predicating truth/falsity of their complements (e.g., *John claimed to have solved the problem, which was true/false*). In English, this class is typically found with raising/ECM constructions, but in other languages one finds control verbs like *believe* and *declare*. Desiderative and interrogative complements, like propositional ones, are intensional. Desiderative complements express (positive or negative) desires, intentions and commands. Both types select irrealis tense in their complements.

(178) *The finiteness rule for OC*
In a fully specified complement clause (i.e., the $I^0$ head carries slots for both [T] and [Agr]):
a. If $I^0$ carries both semantic tense and agreement ([+T,+Agr]), NC obtains.
b. Elsewhere, OC obtains.

Note first that the rule only applies in potentially OC contexts – complement clauses (adjunct OC falling under the separate mechanism of predication; see Chapter 6). It is further restricted to "non-defective" clauses, a class which is meant to cover standard infinitives (whose I head bears [–Agr], "abstract agreement"), subjunctive and indicative clauses. Excluded are raising/ECM complements, small clauses and possibly gerunds (see below), where either [T] or [Agr] (or both) are entirely missing.

(178) is an elsewhere rule. The fundamental insight behind it is simple: OC is the elsewhere case of NC. In other words, the natural class is the set of clauses where lexical DPs and *pro* are licensed as subjects; PRO is licensed in a heterogeneous class of environments, specifically, whenever the I head is specified [+T,–Agr], [–T,+Agr] or [–T,–Agr].[6]

This view yields specific typological predictions, which we confirm below. First, untensed complements (excluding again small clauses) will universally be in the OC class. This follows immediately because regardless of the value of [Agr] in the complement, a [–T] specification excludes NC. More concretely, the predicates in (176) will form the universal core of control verbs; there cannot be a language where modal, aspectual and implicative verbs or evaluative adjectives allow an uncontrolled complement subject. As far as we know, this prediction is correct. One might say that the [–T] property (of the complement) captures the universal semantic aspect of OC.

However, semantics is not enough to fully describe OC (as emphasized in Landau 2006). A second prediction is that uninflected complements (i.e, [–Agr]) which are nevertheless non-defective (so a [T] slot is present) will also display OC. Again, the reason is that regardless of the value of [T], a [–Agr] specification excludes NC. This prediction will play out differently in different languages, depending on the inventory of complement types. Crucially, tensed and untensed complements will not differ in control as long as they are both uninflected.[7]

[6] We simplify Landau's 2004 analysis here. The analysis in fact predicts that certain [+T,+Agr] complements will yield OC if not only I but also C is so specified, resulting in "mutual cancellation." Landau argues that this option indeed yields visible effects in Hebrew subjunctives. Other conceptions of infinitival tense (Wurmbrand 2011) may be adapted to this system, as discussed below.

[7] Saxon (1989) anticipates this insight in her observation that OC effects can come about from two sources: direct selection of PRO by OC predicates like *try*, and selection of an anaphoric Agr (as in Borer 1989) which may but need not produce OC effects. The former class corresponds to Landau's [–T] complements, the latter to [+T] complements.

Let us now turn to the data. Starting from the NC end we find standard indicative clauses. Being both tensed and fully specified for agreement, this is just what we expect on the basis of (178a). Likewise, subjunctive clauses of the Romance and Slavic type display NC: they bear agreement and semantic tense (usually irrealis, but sometimes the realis of factives). A related property of these complements is obviation, which may or may not be subsumed under the present system (see Landau 2004: fn. 37).

Consider now predicates selecting untensed complements. The fact that they induce OC in a language like English is not surprising, given that they are also uninflected.

(179) *OC in [–T,–Agr] complements*
Mary$_i$ remembered/forgot [PRO$_{i/*j}$/*Bill to lock the door].

What is more interesting is that OC is equally forced when these verbs select inflected complements. Notice how the different shapes of the complements below are collapsed together; the only relevant factor is the [–T,+Agr] specification (for evidence that these complements are all semantically untensed, see the sources cited above and Landau 2004).[8]

(180) *OC in [–T,+Agr] complements*

a. *Subjunctive in Greek* (Varlokosta 1993)
O Yanis kseri na kolimbai (*o Giorgos).
the John.NOM knows PRT swim.3SG (*the George.NOM)
'John knows how to swim.'

b. *Inflected infinitive in Hungarian* (Tóth 2000)
Kellemetlen volt Péternek$_i$ [PRO$_i$/**pro*$_j$/*neki$_{i/j}$/*Katinak későn
unpleasant was Peter.DAT PRO/*pro*/him.DAT/Kate.DAT late
érkez-ni-e].
arrive.INF.3SG
'It was unpleasant for Peter [PRO$_{i/*j}$/*for him/*for Kate] to arrive late.'

c. *Nominalized agreeing complement in Basque* (San Martin 2004)
Niri$_i$ [PRO$_i$/*Jon erosketak egitea] ahaztu
I.DAT PRO/*John shopping do.NMZ.DET.ABS forget
zait.
Aux.3ABS.IDAT
'I forgot (*John) to do the shopping.'

Observe now how NC emerges once tense is introduced in such complements by shifting the matrix predicate to one of the predicates in (177). Hungarian

[8] The subject case in Hungarian infinitives is dative, however the embedded subject in (180b) cannot be lexicalized because it is obligatorily controlled. The [+Agr] specification of the complement in the Basque examples (180c)/(181c) is evidenced by the absolutive agreement it triggers on Aux; compare the [–Agr] complement in (183b), which is caseless and triggers no agreement.

has no tensed inflected infinitives, but European Portuguese does, so (180b) should be paired with (181b).

(181) *NC in [+T,+Agr] complements*

a. *Subjunctive in Greek* (Varlokosta 1993)
O Yanis elpizi na figi (o Giorgos).
the John.NOM hopes PRT leave.3SG (the George.NOM)
'John hopes to leave' / 'John hopes that George would leave.'

b. *Inflected infinitive in European Portuguese* (Raposo 1987)
Eu penso/afirmo [ter-em os deputados trabalhado pouco].
I think /claim to.have-3PL the deputies worked little
'I think that the deputies have worked a little bit.'

c. *Nominalized agreeing complement in Basque* (San-Martin 2004)
Jonek$_i$ [pro$_{j/i}$/Mariak ogia
John.ERG pro/Mariak bread-DET.ABS
egitea] pentsatu du.
make.DET.ABS decide AUX.3ABS.3ERG
'John has decided to make bread.' /
'John$_i$ has decided that he$_{i/j}$/Mariak would make bread.'

Let us turn now to the reverse situation, uninflected tensed complements. Again, English (182) is unremarkable. Note that the *for*-infinitive option in English is largely orthogonal to the present point; the option is available, rather erratically, in a subset of irrealis complements, hence is neither a necessary nor a sufficient indicator of tense.

(182) *OC in [+T,–Agr] complements*
Mary$_i$ planned/hated [PRO$_{i/*j}$/*Bill to lock the door].

Less trivially, absence of inflection in complements that *are* potentially inflected in comparable (tensed) environments induces OC.

(183) *OC in [+T,–Agr] complements*

a. *Uninflected infinitive in Welsh* (Tallerman 1998)
Gwnaeth Elen gytuno [i / *iddi ddarllen y llyfr].
did Elen agree to / *to.3Fem.Sg read the book
'Elen agreed to read the book.'

b. *Nominalized non-agreeing complement in Basque* (San-Martin 2000)
Guk$_i$ ez dakigu [PRO$_i$/*Jon nora joan].
we.ERG NEG know PRO/*John where go
'We do not know where (*John) to go.'

The NC-inducing effect of inflection (agreement) on tensed complements in Basque was already seen in (181c). Observe the parallel effect in Welsh (184). Importantly, the embedded tenses in (183a) and (184) are indistinguishable – both are irrealis. It is the sole contribution of [+Agr] – which, as a matter of

selection, is licensed in some complements but not in others – that decides on the issue of control.

(184) *NC in [+T,+Agr] inflected infinitive in Welsh* (Tallerman 1998)
Disgwyliodd Aled [iddi hi/*pro* fynd].
expected Aled to.3Fem.Sg she/*pro* go
'Aled expected her to go.'

Perhaps the most striking illustration of the last point comes from cases where the *same* predicate selects either a [+T,–Agr] or a [+T,+Agr] complement, the mood remaining constant. This would allow us to isolate the effect of [Agr] in an optimally minimal pair. Such pairs require a language with a sufficiently rich complementation system. Turkish appears to be such a language. Like Basque, Turkish uses nominalized clauses for complementation in both OC and NC. The nominalizing suffix *–mE* (glossed below as INF) takes either inflected or uninflected clauses, agreement being reflected by possessive markers. A predicate like *korkmak* "afraid," which selects irrealis tense on its complement, will induce NC or OC depending on whether the complement is inflected or not (Słodowicz 2007).

(185) a. *OC in Turkish [+T,–Agr] nominalized complement*
Ahmet$_i$ [PRO$_{i/*j}$ düş-mek]-ten kork-uyor-du.
Ahmet fall.INF-ABL fear-PROG-PST.3SG
'Ahmet was afraid to fall.'

b. *NC in Turkish [+T,+Agr] nominalized complement*
Ahmet$_i$ [pro$_{?i/j}$ düş-me-sin]-den kork-uyor-du.
Ahmet fall.INF-3SG.P-ABL fear-PROG-PST.3SG
'Ahmet was afraid that he would fall.'

As Słodowicz points out, the inflected complement is actually obviative. This state of affairs is of course reminiscent of English gerunds, suggesting perhaps that the *–ing* suffix should be analyzed as [+Agr] (see Section 4.1.4).

(186) a. John$_i$ was afraid of [PRO$_{i/*j}$ falling].
b. John$_i$ was afraid of [him$_{?i/j}$ falling].

Conversely (as Słodowicz shows), the implicative verb *becermek* "manage" induces OC in both inflected and uninflected complements – precisely because such complements are uniformly untensed.

A similar minimal pair can be constructed with infinitival complements in European Portuguese. As shown above in (181b), when inflected, these infinitives display NC. Crucially, removal of the inflection forces OC. The alternation is sometimes visible with the same matrix predicate (Sitaridou 2007).

(187) a. *OC in European Portugese [+T,–Agr] infinitival complement*
O João$_i$ lamenta [PRO$_{i/*j}$ perder os documentos].
the John regrets lose.INF the documents
'John regrets losing the documents.'

b. *NC in European Portuguese [+T,+Agr] inflected infinitival complement*
O João lamenta [os deputados perder-em os documentos].
the John regrets the deputies lose.INF-3PL the documents
'John regrets that the deputies lost the documents.'

Before closing this section, let us consider a few cases that appear to be problematic to the distributional rule (178), and may call for further refinements.

Finnish and Brazilian Portuguese (BP) have been claimed to display finite control into indicative complements of epistemic and declarative verbs (Rodrigues 2004, Ferreira 2009). If true, these languages would present a challenge to Landau 2004, since complements with inflection and independent tense, on that analysis, should display NC.

As a matter of fact, the case for finite OC in Finnish and BP is far from settled. Modesto (2007b, 2011) argues that the null third person subject in finite complements in these languages is a topic-bound, Ā-variable rather than OC PRO. He notes that this explains the unexpected restriction against object control even with verbs like *convince* and *instruct*, which is lifted once the object undergoes Ā-movement.

Holmberg, Nayudu and Sheehan (2009) point out that both Finnish and BP (and Marathi) "finite control" constructions are too liberal to count as OC. In particular, what we identified as the OC signature is absent: An embedded subject can find an antecedent *two* clauses up (provided the intervening clause contains no potential controller), as in BP (188a), and it is not obliged to be a bound variable, as in Finnish (188b).

(188) a. A Maria$_i$ disse [que é verdade [que *ec*$_i$ entornou o copo]].
DET Maria said that is true that knocked.over the glass
'Maria said it's true that she knocked over the glass.'

b. Vain John$_i$ uskoo [että *ec*$_i$ voitta vaalit].
only John thinks that wins elections
'Only John thinks that he will win the elections.'
[sloppy or strict]

The lack of locality also shows up in "control" into N-complements (of *fact*, *rumor* etc.) and even relative clauses (in Finnish). Hence, there is little doubt that these are not OC constructions. At the same time, they are not as free as NC, since they still require the antecedent to c-command the null subject. Whether or not Holmberg et al. have identified "a third type of control relation," as they speculate, is an intriguing, open question.

A second challenge to (178) comes, once again, from Portuguese, this time from inflected infinitives. Unlike factive complements, which display NC (see (187b)), object control complements display OC both in European and in BP (189a). The same is true of subject control propositional complements in the latter (189b).

(189) a. O pai convenceu os meninos a saírem. *EP / BP*
the father convinced the boys PREP to.leave.3PL
'Their father convinced the boys to go out.'

b. Os motoristas dizem estarem sendo vitimas de assaltos. *BP*
the drivers say to.be.3PL being victims of robberies
'The drivers say they have been victims of robberies.'

Importantly, Modesto (2010a, b) shows that these complements display the OC signature (no arbitrary reading, sloppy and *de se* readings etc.). The question is why the co-occurrence of semantic tense and agreement in these complements is not sufficient to license an uncontrolled subject. We can offer but a speculation at this preliminary stage (the precise distribution of inflected infinitives in BP has yet to be documented). It is well known that finite inflection in BP is "defective" in not being able to license *pro*-drop (Kato and Negrão 2000). Moreover, the nonfinite inflection is rather poor too, being marked only in the plural. Finally, and perhaps most tellingly, Modesto points out that untensed complements (modal, aspectual and implicative) never exhibit inflection. This suggests that nonfinite [+Agr] in BP is really parasitic on nonfinite [+T] (and further restricted in other ways) rather than an independent feature of the inflectional system. Possibly for this reason it does not "count" as an independent slot in the licensing sense required for (178) (the question remains how this suggestion can be extended to (189a) in EP).

Just as the theoretical construct [Agr] may conceal more complexity than is normally suspected, so may the theoretical construct [Tense], especially when applied to different types of infinitives. In a recent revealing study of the temporal properties of infinitival complements, Wurmbrand (2011) identifies three types: tenseless infinitives (covering aspectual and implicative complements), future infinitives (covering all irrealis complements) and zero-tense infinitives (covering propositional complements); these types cut across raising and control. The first type (e.g., complements of *begin*, *dare*) projects a truncated clausal structure up to Aspect Phrase (AspP) and not beyond, lacking TP and CP. The second type (e.g., complements of *decide*, *plan*) projects a Modal Phrase headed by the future modal *woll* (this modal, combined with finite present tense, produces *will*); again, no TP or CP is projected. Finally, the third type (e.g., complements of *claim*, *believe*) projects a TP, headed by a zero/null Tense, but no CP. These proposals are motivated by a detailed examination of the temporal interpretation of infinitives; most notably, their "relative time" interpretation and invisibility for Tense-deletion in Sequence-of-Tense contexts.

The semantic content of Wurmbrand's proposals is well-supported; the question is whether it is best couched in a non-uniform theory of syntactic projection (and selection), as implied by the three-way distinction between AspP, *woll*P

and TP. Least problematic are the tenseless infinitives (implicative and aspectual), the core of restructuring complements, which may well be subclausal. As to irrealis complements, Wurmbrand concedes that nothing (beyond theory-internal considerations) excludes positing a zero-tense in them, layered on top of *woll*P. Then one may ask whether there is any syntactic evidence for a CP projection; in fact there is quite a bit (see Section 3.1). Furthermore, irrealis and propositional infinitival complements display partial control, which is best explained by reference to a mediating C head (see Section 5.2). One may hope, then, that the ultimate semantic analysis of infinitival tense would be assimilated with an equally adequate analysis of their syntactic composition.

Returning to the main issue, a very broad and diversified array of crosslinguistic data supports the idea behind (178): namely, NC is guaranteed by the co-occurrence of semantic tense and morphological agreement on the inflectional head in the complement, and OC obtains elsewhere. At this point one can imagine several ways to implement this idea technically. Landau 2004 appeals to a "referentiality" feature [R] (Reinhart and Reuland 1993), which is negatively specified on PRO and positively on lexical DPs and *pro*. A [+T,+Agr] combination on I induces a [+R] feature, which must be checked by [+R]-bearing elements; any other combination induces a [–R] feature, which only PRO can check. Whether one adopts this analysis or not, some mediating device is needed to correlate the T/Agr values of I with whatever feature sets PRO apart from other DPs. Furthermore, case cannot do the job, for reasons elaborated in Section 4.3. The basic challenge is to capture the empirical content of the "elsewhere" rule (178).

Before concluding, let us note that the empirical content of Landau's partition of control predicates and clausal complements is closely matched by the independent typological work of Stiebels 2007, once the different terminologies are aligned. Stiebels sets out to tease apart the lexical and the syntactic ingredients of complement control. On the syntactic level, she distinguishes between control-inducing and control-neutral complements. The former are used exclusively in OC contexts; they are typically "deficient" in failing to license one argument position (canonically, the subject). Infinitives are the core example of control-inducing complements. By contrast, control-neutral complements can be used both in control and in "no control" contexts. Typically, subjunctive and indicative complements are control-neutral, as well as nominalizations; all these contexts can (in principle) license an overt lexical subject.

On the lexical level, Stiebels distinguishes between inherent-control predicates and structural-control predicates. The former impose OC on any type of complement they occur with; the latter display OC only in combination with control-inducing complements.

The two binary distinctions are readily translated into Landau's (2004, 2006) system. Control-inducing complements are specified for [–Agr] and control-

neutral complements are specified for [+Agr]. More specifically, the two types of control-inducing complements are covered by [±T, –Agr] and the two types of control-neutral complements are covered by [±T, +Agr]. The former are consistently "deficient" (= specified [–R]) owing to the [–Agr] value; the latter are deficient or not depending on their value of T ([–T,+Agr] and [+T,+Agr], respectively), hence they are "neutral." These value assignment are naturally applied to infinitives ([–Agr]) and subjunctives/indicatives ([+Agr]). Nominalizations could be assumed to be "inflected", or, more plausibly, to lie outside this system, their "control-neutrality" related to the OC-blocking DP layer (see Section 1.6).

On the lexical level, Stiebels' inherent-control verbs select untensed ([–T]) complements while structural-control verbs select tensed ([+T]) complements. In combination with [±Agr], the former type will uniformly induce OC whereas the latter type will do so only with control-inducing complements ([+T, –Agr]). Stiebels further distinguishes between strong and weak inherent-control verbs; the latter allow [+Agr] in their complements (e.g., controlled subjunctives), the former do not. "Marked inherent-control verbs" only occur with control-neutral complements and yet impose OC; this corresponds to [–T,+Agr]. Finally, "no control verbs" exclusively select control-neutral complements and do not display OC.[9]

A detailed study of complement control, based on Stiebels' categories, was applied by Słodowicz 2008 to Polish. The results are in perfect harmony with Landau's theory. The predicates that are classified as "inherent-control" predicates are modal, phasal (=aspectual), achievement (=subject control implicative), and strong manipulation (=object control implicative) (see Słodowicz 2008: 103). Note that these fall under the verb classes in (176a–176c), characterized above as the universal core of OC verbs; all select untensed complements. The predicates that are classified as "structural control" are weak manipulation (=irrealis object control verbs) and attitude verbs (=irrealis and propositional subject control verbs). These fall under (177b–177c), selecting tensed complements. Thus, typological work from independent strands converges on the same idea: OC or NC are determined by local values of (semantic) [T] and (morphological) [Agr] on selected complements.

[9] Recently, Reed (2010) claimed to have identified a class of verbs that universally exclude OC complements; among them are *remark*, *disclose*, *explain*, *suspect*, *charge* (on the "accuse" sense), etc. The crucial property that distinguishes these verbs is that the tense of their (finite) complements is unrestricted by the matrix tense. If the generalization holds true, it implies that the calculus of OC is only "set in motion" when some value for [T] (dependent or anaphoric) is selected on the embedded clause. Reed further argues that the complements of the "no control" verbs denote "Facts" in the sense of Asher 1993, 2000, a metaphysical concept distinct from the familiar linguistic category "factive" (e.g., *suspect* is not factive, but takes a "Fact"-denoting complement). However, it is not clear that the concept of "Fact" plays any role in the explanation of why OC is blocked with these verbs; tense-independence may be all that is needed.

### *4.1.3 Mood and control*

The T/Agr calculus provides the most reliable and comprehensive predictive theory of the distribution of OC to date, but it too may be insufficient for certain languages. A case in point is Korean, where OC complements bear no agreement or tense morphology; instead, the control status of the complement is determined by the combination of the matrix verb and a specific mood marker in the embedded clause (Madigan 2008a, Lee 2009). The five OC-inducing markers may occur in simple clauses, in which case they convey the sense that the action is volitional, promissive, intentive, imperative or proposative. When embedded under the appropriate verbs, they induce speaker-control, addressee-control or split control.

As Madigan shows, both the presence of OC and the choice of controller are affected by the specific mood marker. This is clearly seen with relatively "flexible" verbs like *mal* "say," that lend themselves to several options. The examples below all use this verb; the mood markers are highlighted.

(190) a. Inho$_i$-ka Hwun$_j$-eykey pro$_{i/j/k}$ swuyeng-ha-**n**-**ta**-ko mal-ha-yess-ta.
Inho-NOM Hwun-DAT swim-do-IND-DC-C tell-do-PST-DC
'Inho$_i$ told Hwun$_j$ that he$_i$/she$_j$/someone is swimming.'

b. Inho$_i$-ka Hwun$_j$-eykey PRO$_{i/*j/*k}$ cip-ey ka-**keyss**-ta-ko
Inho-NOM Hwun-DAT home-to go-VOL-DC-C
mal-ha-yess-ta.
tell-do-PST-DC
'Inho$_i$ said to Hwun$_j$ that he$_i$/*she$_j$/*someone would go home.'

c. Inho$_i$-ka Hwun$_j$-eykey PRO$_{*i/j/*k}$ swuyeng-ha-**la**-ko mal-ha-yess-ta.
Inho-NOM Hwun-DAT swim-do-IMP-C tell-do-PST-DC
'Inho told Hwun to swim.'

The indicative present tense marker *(n)un-ta* does not induce control (190a); the volitional marker *keyss* induces speaker (=subject) control (190b); and the imperative marker *la* induces addressee (=object) control (190c). Split control, under the same verb, would be induced by the exhortative marker *ca* (see Section 5.3). Mood selection is constrained by semantic coherence; for example, *promise* may not select the imperative *la* and *order* may not select the promissive *keyss*. At the same time, the range of available OC readings is much more varied than English since it is sensitive not just to the semantics of the matrix verb but also to the semantics of the embedded mood marker.

It is not inconceivable that the Korean mood-marking system can be unified with the T/Agr system at some higher level of abstraction. For example, the translations above indicate that the embedded tense in (190a) is independent whereas the embedded tense in (190b) is dependent (irrealis). This contrast would be explicitly reflected in Landau's calculus as "no [T]" vs. [+T] on the embedded C. On the other hand, barring honorific morphology, it is not clear

that Korean has any genuine correlate of [Agr]. Thus, Madigan may be correct in suggesting that distinct underlying mechanisms may be responsible for OC in different languages.[10]

### *4.1.4 Open problems: DP/PRO free alternation*

Lest it be thought that our understanding of the finiteness ingredients underlying control is complete and satisfactory, I list in this section a number of recalcitrant cases that do not find a comfortable explanation under any current theory. These cases all share the same profile: a subject position in a nonfinite clause allows either PRO or a lexical DP in what appears to be a free alternation, with no independent, detectable co-varying feature of the clause (e.g., T, Agr or mood). The absence of any distinguishing feature between the OC and the NC environments makes these cases such hard chestnuts to crack for any principled account of the distribution of PRO.

Perhaps the most famous problem involves English gerunds. Restricting attention to complements, there is some predictability. Pires (2007) points out that [–Tense] gerunds force OC (191a–191b), whereas [+Tense] gerunds alternate between OC and NC (191c) (note the temporal mismatch evidence).

(191) a. Philip$_i$ tried/avoided [PRO$_i$/*Jane driving in the freeway].
b. * Philip$_i$ tried/avoided last night [PRO$_i$ driving in the freeway this morning].
c. Last week, Sue favored/insisted on [PRO$_i$/Anna moving to Chicago today].

For (191a–191b), one could perhaps attribute OC to the absence of tense. Note, however, that this would imply that gerunds are also specified for an abstract [Agr], given that rule (178) does not apply to partially specified (defective) I heads. Is this [+Agr] or [–Agr]? Both options would yield OC in (191a), due to the [–T] feature, but neither would predict the alternation in (191c): [+T,–Agr] should only produce OC and [+T,+Agr] should only produce NC. There are conceivable technical ways around this problem but none of them seems particularly illuminating.

Working within the A-movement theory of OC, Pires (2007) offers the following explanation for (191c). The embedded subject would have to raise into the matrix clause whenever the numeration contains no other DP that can check the matrix subject θ-role. The option of retaining a lexical subject in the gerund hinges on case being available to it via the *-ing* head, itself requiring case-valuation from the outside (hence, gerunds must occupy case positions,

[10] Another system of clausal marking that interacts with control is the system of switch reference. Languages with same-subject markers may use them in finite complements to signal a control interpretation. According to Stiebels (2007), however, this device is rarely used to implement *obligatory* control.

see Reuland 1983). The matrix light v can probe either the gerund TP (for case checking) or its subject (for θ-checking), both being equi-distant from it (as one is contained inside the other).[11]

The DP/PRO alternation is more bewildering in gerundive adjuncts, depending in mysterious ways on the type of the adjunct. *While*-adjuncts exclude lexical subjects (192a), *before*-adjuncts allow either PRO or obviative subjects (192b), and *despite*-adjuncts, and absolutive ones, impose no restriction on their subjects (192c–192d) (examples (192a–192c) are from McCawley 1988: 142). These facts (and similar ones in other languages) still await explanation.

(192) a. John$_i$ became disillusioned [while PRO$_i$/*his/*our working for the government].
b. John$_i$ got rich [before PRO$_i$/his$_{j/*i}$ working for the government].
c. John$_i$ got rich [despite PRO$_i$/his$_{j/i}$ having had hardly any education].
d. [Mary/PRO$_i$ having finally returned home], John$_i$ felt at peace.

Free alternation between DP and PRO is common in nonfinite clauses in Dravidian languages (Mohanan 1982, Gair 2005, Sundaresan and McFadden 2009). In complements, so it seems, OC is forced only with the "universal set" (176), i.e., verbs selecting untensed complements. Any other infinitive-selecting verb allows the alternation (193a).[12] With adjuncts the alternation is completely general and unconstrained (193b).

(193) a. *Malayalam* (Mohanan 1982)
Amma$_i$ [kuṭṭik'k'ə /PRO$_{i/*j}$ wisākk-aan] aagrāhiccu.
mother.NOM child.DAT be.hungry.INF wanted
'The mother$_i$ wanted the child/PRO$_{i/*j}$ to be hungry.'
b. *Tamil* (Sundaresan and McFadden 2009)
[Vasu/PRO$_{i/*j}$ poori porikk-a] raman$_i$ maavu
Vasu.NOM pooris.ACC fry.INF Raman.NOM flour.ACC
vaangi-n-aan.
buy-PST-3SG.M
'Raman$_i$ bought flour PRO$_{i/*j}$/for Vasu to fry pooris.'

As the authors make clear, there is no morphological, syntactic or semantic distinction between the versions with PRO and those with the lexical subject. Barring unmotivated abstract distinctions, this is a case of free alternation. Sundaresan and McFadden (2009) further discuss the AcI construction ('accusative-with-infinitive'), found in Ancient Greek, Latin and Middle

[11] Note that this runs contrary to the standard account of locality constraints on remnant movement, which crucially assumes that X intervenes for Y if they bear the same feature in [$_X$ . . . Y . . . ] (Müller 1998).

[12] The embedded subject in (193a) is quirky, receiving dative case from the predicate *hungry*. When the embedded predicate does not assign quirky case, the subject is nominative. Thus, this is not an ECM construction; both the lexical subject and PRO are licensed and case-marked internally to the infinitive. Similarly for the accusative case in (194a), which cannot receive an ECM analysis, the sentence being passive.

English. These infinitives occur in a variety of contexts (subject, adjunct, extraposed and complement positions), all of which allow an alternation between PRO and an accusative subject.

(194) *Ancient Greek* (adapted from Andrews 1971)
a. Legetai tous andras elthein.
it.is.said the men.ACC to.have.come
'It is said that the men have come.'
b. *pro*$_i$ [PRO$_i$ Perse:s einai] ephe:.
Persian to.be he.said
'He said that he was Persian.'

Another language exhibiting a free alternation between control infinitives and AcI is Irish (McCloskey 1980, 1985, McCloskey and Sells 1988, Carnie and Harley 1997, Harley 2000, Bondaruk 2006; see Tallerman 1998 for a similar claim for Welsh).

(195) a. Bheinn sásta [iad a bheith i láthair].
I.would.be glad them.ACC PRT be.INF present
'I would be glad for them to be present.'
b. Tá mé sásta [PRO a bheith anseo].
am I glad PRT be.INF here
'I am glad to be here.'

As in Ancient Greek, overt accusative subjects appear in all types of Irish infinitives, including root infinitives. Carnie and Harley attribute the alternation to the absence of the EPP requirement from Irish (McCloskey 1996). Their reasoning is that EPP languages (like English) recognize two "flavors" of the EPP feature: [overt] EPP and [null] EPP. The former requires a lexical subject in finite clauses, the latter a PRO subject in infinitives. Since Irish lacks the EPP altogether (or rather, has a "weak" EPP), it cannot make the [overt]/[null] distinction as far as subjects are concerned; hence the DP/PRO alternation. Besides the issue of whether Irish allows PRO as a finite clause subject, the deeper problem with this account is that it replicates the distinction to be explained: [overt] EPP feature vs. [null] EPP feature is no more explanatory than DP vs. PRO. The account does make a strong crosslinguistic prediction – "no EPP" languages will display DP/PRO alternations – but only at the cost of leaving unexplained the very contrast between infinitives and finite clauses in EPP languages (like English).

A final challenge to the common view of subject licensing is the so-called *personal infinitive* in Romance languages, which features an overt nominative subject (Vinet 1985, Rigau 1995, Torrego 1998, Mensching 2000, Sitaridou 2002, 2007, Pöll 2007, Herbeck 2011).[13]

[13] This construction should be distinguished from the inflected infinitive of Portuguese, Galician and Sardinian, on the one hand, and from ECM clauses with accusative subjects, on the other

(196) a. *Spanish*
Antes de actuar **Caballé**, el público estaba expectante.
before of perform.INF Caballé the audience be.PST.3SG expectant
'Before Caballé performed, the audience was expectant.'

b. *Occitan*
Se plorava dempuei tres jorns sens
REFL cry.IMP.3SG since three days without
**eu** lo poder consolar.
I.NOM him can.INF console.INF
'He wept for three days without me being able to console him.'

c. *Italian*
Prima di morire **papà**, mama era felice.
before of die.INF father mother be.PST.3SG happy
'Before father died, mother was happy.'

There is great variability among Romance languages as to the range of uses of personal infinitives (see Mensching 2000 for a comparative description). Nevertheless, they seem to obey one *negative* generalization: they are never found in complement positions.[14] Thus, they are found as subject and dislocated clauses, adjuncts, modifiers, predicates and complements to nouns. The lexical subject typically occurs postverbally, however a pronominal subject may occur preverbally (as in (196b)).

The literature is not always clear about the possibility of PRO replacing the lexical subject in these infinitives. The issue is hard to test since all the languages involved are also *pro*-drop languages. Thus, the missing subject in these infinitives may well be *pro*, which must be distinguished from NOC PRO. The relevant tests are known (see Chapter 7), but have not been applied to these constructions. Vinet (1985) argues that the personal infinitive in Quebec French can either host a lexical subject or PRO, but Sitaridou (2002: 198) argues that the construction is misanalyzed and the alleged lexical subject is always a matrix controller of a null PRO.

The important point here, nonetheless, is that even if Romance personal infinitives do not allow an OC variant, the mere fact that they do license lexical (nominative) subjects is a theoretical challenge for most theories of subject licensing. One can think of two responses to the challenge. On the "licensing" view (in which DPs must be licensed), one would have to say that it is the presence of semantic [Tense] that is sufficient for a lexical subject to surface (possibly via nominative case assignment). To avoid overgeneration, one would have to explain why [Tense] is not sufficient to license a lexical subject in all syntactic contexts and in all languages. On the "no-licensing" view (Sundaresan

hand. These two constructions are relatively unproblematic as far as the licensing of their subject is concerned; they also do not seem to have OC variants.

[14] Unless the C position is lexicalized, as in Sardinian, or the infinitive is inflected, as in European Portuguese (see Sitaridou 2002, 2007).

and McFadden 2009) the problem is the same, only now it reduces to identifying the selecting head that forces a PRO subject in contexts that allow lexical subjects in other languages. The problem is particularly difficult since most of the problematic configurations involve adjunct infinitives, which are not selected.

This section has surveyed presently known challenges to a comprehensive theory of finiteness and control; that is, the theory that studies the clause-internal determinants of the nature of the subject (PRO/DP). Faced with the range of crosslinguistic variation and the multitude of relevant features (position of the clause, internal word order, the governing preposition etc.), it is fair to say that we are currently very far from understanding these matters in any depth. For complement clauses, we do have a broad generalization (178) that seems to face problems only in very narrow areas (gerunds and possibly Celtic languages). For non-complement clauses, however, we still lack a principled, predictive schema with significant crosslinguistic coverage.

*Further reading*

For relevant works on the topic of 4.1, see Chomsky and Lasnik 1977, Chomsky 1981, Mohanan 1982, Bouchard 1984, Comorovski 1985, Farkas 1985, Iatridou 1988, Terzi 1992, 1997, Varlokosta 1993, Rivero 1994, Carnie and Harley 1997, Tallerman 1998, Krapova and Petkov 1999, Philippaki-Warburton and Catsimali 1999, Hornstein 1999, 2003, Dobrovie-Sorin 2001, Krapova 2001, Roussou 2001, Sitaridou 2002, 2007, Wurmbrand 2002, 2003, Landau 2004, 2006, San-Martin 2004, Rodrigues 2004, McFadden 2005, Boeckx and Hornstein 2006b, Bondaruk 2006, Słodowicz 2007, Pires 2007, Madigan 2008a, Bobaljik and Landau 2009, Lee 2009, Sundaresan and McFadden 2009, Szabolcsi 2009.

## 4.2 Case marking and case transmission

The standard approaches to nominative case (originating in Chomsky 1981) assumed that it was tightly linked to finiteness. Thus, either [+Tense] or [+Agr] were held responsible for the assignment of nominative case to the subject of a finite clause. By implication, a nonfinite I head was incapable of assigning case. This meant that PRO does not bear case, perhaps it is even so defined (Bouchard 1984). This result was taken for granted in much of the GB literature, the only interesting question being – what exempts PRO from the case filter?

Within minimalism, the idea that PRO is caseless was revived in the A-movement approach (Hornstein 1999 and subsequent work). A different proposal held that PRO is assigned a special "null case," guaranteeing its nullness (Chomsky and Lasnik 1993, Bošković 1997, Martin 2001). Either way, the case properties of PRO were taken to be fundamentally different from those of standard lexical NPs.

Notice that this position can be, at most, empirical, and not conceptual. The reason is, plainly, that syntactic features need not be morphologically expressed

in all circumstances. To illustrate, clause-bound agreement with PRO on some ϕ-feature is taken, uncontroversially, as evidence for the presence of that feature on PRO.

(197) Mary proposed to Paul [PRO to become partner**s**].

What does the plural morpheme *–s* in the infinitive agree with? Plainly, with the [plural] feature on PRO (there is no other plural DP in the sentence). One does not suggest that PRO bears a special "null" [plural] feature, that lexical DPs cannot bear. The standard way of treating such facts is to assume a full set of standard ϕ-features on an element that happens to be phonologically null. The question whether case is or is not one of these features, therefore, is entirely a question of fact.

And the facts speak clearly – PRO does bear case. The evidence is parallel to (197) – agreement phenomena (case concord). In many languages, items like predicates, emphatic pronouns, reflexives, floating quantifiers and classifiers are inflected for case. The specific morphological case they bear reflects (or agrees with) the case borne by the local DP with which they are associated (concord is clause-bound). Thus, when subject-oriented, such items make reliable detectors for the case of PRO.

The evidence has been around for a long while, at least evidence from Ancient Greek (Andrews 1971), Russian (Comrie 1974) and Icelandic (Andrews 1976). Subsequent research on these and other languages has revealed a uniform pattern: whenever the language provides means to detect the case of PRO, it is identical to the case that a lexical DP would have borne in the same position. A secondary pattern reveals that sometimes the case of PRO may be inherited from its controller (case transmission). We return to this option below.

The following data (taken from Landau 2006) illustrate independent case-marking of PRO in different languages. In all of the examples, the case of the controller and that of PRO (boldfaced in the examples) are *distinct*; thus, we can be sure that case is assigned internally to the embedded clause. The type of case (structural or quirky) as well as its value (NOM, ACC, DAT etc.) varies depending on the language and the choice of verbs.

(198) a. *Icelandic* (quirky ACC)
Strákarnir vonast til [að PRO vanta ekki alla
the boys.**NOM** hope for to PRO.**ACC** to.lack not all.**ACC**
í skólann].
in the.school
'The boys hope not to be all absent from school.'

b. *Russian* (structural DAT)
My poprosili Ivana [PRO pojti odnomu].
we.NOM asked Ivan.**ACC** PRO.**DAT** to.go alone.**DAT**
'We asked Ivan to go alone.'

c. *Polish* (structural DAT; from Bondaruk 2008)
Marek uczył Marię [PRO samej naprawiać
Mark.NOM taught Mary.**ACC** PRO.**DAT** alone.**DAT** to.repair
komputer].
computer
'Mark taught Mary to repair a computer alone.'

d. *Hungarian* (structural DAT)
Illetlenség volt Mari-tól [PRO ilyen türelmetlen-nek
impoliteness was Mary-**ABL** PRO.**DAT** so impatient-**DAT**
lennie].
to.be.3sg
'It was impolite of Mary to be so impatient.'

e. *German* (structural NOM)
Hans hat die Zeugen gebeten [PRO
John has the witnesses.**ACC** asked PRO.**NOM**
einer nach dem anderen einzutreten].
one.**NOM** after the other in.to.step
'John asked the witnesses to step in one after the other.'

f. *Korean* (structural NOM)
Cwungtaycang-i psengsa-tul-lul [PRO cekci-ey sey
captain.NOM soldier.PL.**ACC** PRO.**NOM** territory-to 3
myeng-i ka-la-ko] seltuk-ha-ta.
CLASS.**NOM** go-IMP-COMP persuade-DO-DECL
'The captain is persuading the three soldiers to go into enemy territory.'

g. *Greek* (structural NOM)
Anangasan tin Eleni [PRO na milisi afti
forced.3PL the Eleni.**ACC** PRO.**NOM** PRT speak.3SG she
i idhja].
herself.**NOM**
'They forced Helen to speak herself.'

h. *Romanian* (quirky DAT)
Maria$_i$ va încerca [PRO$_i$ să nu i se facă ei$_i$
Maria.**NOM** will try PRO.**DAT** PRT not miss her.**DAT**
prima dor de Bucureşti].
the first of Bucharest
'Maria will try not to be the first of them who misses Bucharest.'

Note that the subjunctive complements in (198g–198h) display OC, hence contain a PRO subject, as discussed in the previous section.

It is worth pointing out that the nominative case on PRO cannot be some "default," non-structural case. A direct way to test this is to check whether it governs agreement: structural case does, default case does not. Indeed, there is extensive evidence, at least in Icelandic, that nominative PRO governs agreement just like any finite clause subject, which is assigned

structural nominative case (Thráinsson 1979, Sigurðsson 1991, 2002, 2008).[15] The agreeing element may be a passive participle or a predicate nominal. By contrast, a quirky subject never governs agreement on the main predicate, which surfaces with default inflection. This is illustrated in the minimal pair below, from Sigurðsson 1991 ("was aided" selects a standard, nominative subject; "was helped" selects a dative subject).

(199) a. Strákarnir vonast til að verða aðstoðaðir/*aðstoðað.
the.boys.NOM hoped for to be aided.NOM.PL/*DFLT
'The boys hope to be aided.'

b. Strákarnir vonast til að verða hjálpað/*hjálpaðir/*hjálpuðum.
the.boys.NOM hoped for to be helped.DFLT/*NOM.PL/*DAT.PL
'The boys hope to be helped.'

A secondary pattern involves case transmission from the controller to PRO. Instead of bearing the structural, locally assigned case, PRO surfaces with the case of the controller, which could be either structural or inherent (again, detectable via case concord). Crucially, if PRO locally gets inherent/quirky case, it resists case transmission from the controller. Similarly, "case percolation," from PRO upwards to the controller, is unattested (Davies 1988).[16] Crosslinguistically, the available options are the following.

(200) *Case patterns in OC*

a. Case independence
$\ldots DP_{[\alpha Case]} \ldots [PRO_{[\beta Case]} \ldots]$

b. Case transmission
$\ldots DP_{[\alpha Case]} \ldots [PRO_{[\alpha Case]} \ldots]$ (blocked if PRO gets local quirky case)

c. * Case percolation
$\ldots DP_{[\alpha Case]} \ldots [PRO_{[\alpha Case]} \ldots]$

The specific partition of the data between case independence and case percolation varies from one language to the other. Moreover, there is considerable inter-speaker variability in this domain; a given sentence may allow only case transmission or only case independence for one speaker but either option for another. Nevertheless, some general principles are discernable. Landau 2008 is the most comprehensive account of the case patterns in OC to date, concerned mostly with Russian but also covering other languages. We summarize its findings below.

[15] This point is stressed again in Bobaljik and Landau's (2009) reply to Boeckx and Hornstein (2006a), who take nominative case on PRO to be default case.

[16] See Landau 2008 for rare exceptions.

In Russian, the independent structural case assigned to PRO is dative. This is the only option in *wh*-complements, oblique control (by non-accusative objects), control by implicit arguments into N-complements, and in NOC environments. The opposite pattern, obligatory case transmission, is attested in subject control without an intervening object or lexical complementizer. In between, we find optional case transmission in subject control across an intervening object or complementizer, object control and subject control into N-complements. We illustrate the three patterns below.

(201) a. *Obligatory case independence*
Ivan dumaet čto [PRO pojti domoj odnomu/*odin] važno.
Ivan.NOM thinks that PRO to.go home alone.**DAT/*NOM** important
'Ivan thinks that it is important to go home alone.'

b. *Obligatory case transmission*
Ona sobiralas' [PRO.**NOM** putešestvovat' odna/*odnoj v
she.**NOM** planned to.travel alone.**NOM/*DAT** in
Japonii].
Japan
'She planned to travel alone in Japan.'

c. *Optional case transmission*
Ona ugovorila ego [PRO.**ACC/DAT** pogovorit'
she.NOM convinced him.**ACC** to.talk
samogo/samomu s ejo roditeljami].
himself.**ACC/DAT** with her parents
'She convinced him to talk himself to her parents.'

In Landau's system, case transmission is parasitic on the Agree relation which establishes OC in the first place (see Section 2.5). If the local (embedded) T or C are unspecified for case, the probe will value both the case of PRO and that of the controller. Several grammatical factors interact to yield the complex pattern. First, case specifications on the infinitival T and C heads, which may vary from one language to the other. Second, the clitic-like nature of null C, which is involved in imposing case transmission (cliticization "suppressing," so to speak, C's case feature).[17]

Crosslinguistic variation occurs within rigid boundaries. Some languages are uniformly case-transmission languages – PRO never displays independent case (Latin, Czech, Slovak, Slovenian); other languages have optional case transmission in which the infinitival C is implicated (Russian, Polish, Ancient Greek); and other languages have optional case transmission in which the infinitival T is implicated (Icelandic).

[17] In Section 5.4 we return to some interesting interactions between case transmission in Russian and partial control.

All in all, case patterns in control bear important lessons to grammatical theory. The most elementary one is that case (abstract or morphological) cannot be the feature distinguishing the distribution of lexical DPs and PRO (see Landau 2006 and references therein). Nevertheless, because structural case is so tightly connected to configurational factors, case transmission phenomena make an excellent probe into the syntax of OC. At the same time, they bear on the broader theories of case and agreement, further sharpening our understanding of notions like structural/inherent/quirky/default case.

*Further reading*

For relevant works on the topic of Section 4.2, see Andrews 1971, 1976, 1982, 1990, Comrie 1974, Thráinsson 1979, Quicoli 1982, Schein 1982, Greenberg 1983, 1989, Neidle 1982, 1988, Davies 1988, Sigurðsson 1991, 2002, 2008, Greenberg and Franks 1991, Babby 1998, Babby and Franks 1998, Franks 1990, 1995, 1998, Hudson 2003, Cecchetto and Oniga 2004, Bondaruk 2004, 2006, 2008, Przepiórkowski and Rosen 2005, Boeckx and Hornstein 2006b, Witkoś 2007, 2008, 2010, Janke 2008, Landau 2008, Ussery 2008, Bobaljik and Landau 2009, Boeckx, Hornstein and Nunes 2010a.

## 4.3 Is PRO necessarily a subject?

The discussion so far has assumed, in line with the vast majority of the literature, that only subjects are susceptible to control. In other words, it was taken for granted that languages may realize option (202a) but never option (202b).

(202) a. Richard$_i$ tried [PRO$_i$ to catch Molly].
b. * Molly$_i$ tried [(Richard) to catch PRO$_i$].

This assumption, however, has not gone unchallenged. In Section 4.3.1 we sketch various theoretical devices employed to guarantee the subjecthood of PRO. The reader will no doubt perceive that these devices are, for the most part, unprincipled. In Section 4.3.2 we present some crosslinguistic evidence that possibly explains why theories of control cannot comfortably derive the subjecthood of PRO: perhaps it is *not* a universal requirement.

### *4.3.1 Theoretical accounts for the subjecthood of PRO*

As discussed in Section 4.1.1, the first generative attempt to derive the distribution of PRO from deeper principles is offered in Chomsky 1973. Control of PRO was viewed as a rule – Equi-NP Deletion. Two general constraints specified the locality of such rules: The Tensed-S Condition (TSC) prevented the rule from

crossing a finite clause boundary and the Specified Subject Condition (SSC) prevented it from crossing an intervening subject. Later discoveries of finite control indicate that the TSC (or any of its alternative formulations) should be discarded (Section 4.1.2). Turning to the SSC, the necessary subjecthood of PRO was derived as follows. If PRO is not a subject, then there is some other subject X in its clause, such that the Equi rule crosses it: $NP_i \ldots [X \ldots PRO_i]$. This, then, violates the SSC.

The problem of the "distribution of PRO" was highlighted by Chomsky (1981) and thus became a central challenge to all theories of control. Except for a few dissenting works (to which we turn below), the mainstream consensus was that the problem reduces to explaining why PRO can only occupy a subject position.

A class of proposals attempts to derive this property from the fact that the subject bears a privileged relation to the inflectional head of the clause, I(nfl) or T(ense). In GB, PRO could only be licensed in ungoverned positions. All argument positions were governed – except the subject of a nonfinite clause (or an NP). By excluding nonfinite I from the class of governors, GB ensured that only its subject could host PRO. This approach was resurrected in form (though not in detail) by the null case account (Chomsky and Lasnik 1993, Bošković 1997, Martin 2001): PRO must be assigned a special null case, and the only assigner of that case, by stipulation, was nonfinite I. Locality considerations guarantee that the only potential position in which PRO could be assigned that case is the subject position (an object would be too remote, being separated from I by a distinct subject).

A third variation on this idea was developed in Borer 1989. For Borer, the controlled element was not PRO but an anaphoric Agr, residing in nonfinite I. I establishes a coindexing (agreement) relation with the NP it governs – which is the subject. Thus PRO (or *pro*, in Borer's analysis) must be a subject. This intuition is carried over to the Agree model of OC (Landau 2000, 2004, 2006), where the relevant feature on the clausal head (I or C) is not [+anaphor] but [−R] ("referential deficiency"). PRO is the only NP that bears this feature, and due to locality of feature checking, must be the closest one to I – hence, a subject.

In the predicational theory of OC, the subjecthood of PRO follows automatically. The target of control is a property-denoting phrase, in which one argument position is unsaturated. If this phrase is a bare VP, the unsaturated argument is simply the one not projected – the subject. If the phrase is a clause, it must become predicative by some process of "argument binding"; this process is arguably restricted to the external argument (Williams 1980, 1987). In the A-movement theory of control, the subjecthood or PRO (ultimately, a trace) is reduced to whatever explains the subjecthood of raising targets. The syntactic locality of A-movement guarantees that no NP lower than the subject

would be able to move across it to the matrix clause. Thus, the only possible A-movement out of a clause is that of its subject.

An interesting attempt to derive the subjecthood of OC PRO is developed in Clark (1990). Clark treats control clauses as null operator constructions (see (119)). Surveying a battery of such constructions (*tough*-movement, parasitic gaps, infinitival relatives etc.) he arrives at the following distributional generalization: a null operator chain [$_{CP}$ $Op_i$ [ . . . $t_i$ . . . ]] is licit if and only if either $t_i$ or CP (or both) are not in a case position. Otherwise, the operator must be realized overtly (e.g., a *wh*-word). The generalization is derived from a lexicalization requirement on case-marked elements, as Clark puts it: "The pairing of a Case-marked CP with a Case-marked $\bar{A}$-chain is simply more than a phonologically null element can tolerate; in this environment, the non-overt operator must be lexicalized" (p. 196). Clark notes that this derives not only the impossibility of "*tough*-verbs" (on the assumption that a verb's complement, but not an adjective's complement, is a case position), but also the subjecthood of OC PRO.

(203) a. * Mary tried [$_{CP}$ $Op_i$ [PRO to hire $t_i$]].
b. Mary tried [$_{CP}$ $Op_i$ [$t_i$ to hire somebody]].

The CP complement occupies a Case position, and so is the object $t_i$ in (203a), but not the subject $t_i$ in (203b). More generally, since the subject of nonfinite clauses is not case-marked, it will always be an available launching site for Op-movement (the mechanism of control for Clark). And since complements of verbs always occur in case-marked positions, they will never tolerate any internal trace of Op in a case position.

This account, although embedded in an ingenious theory of the distribution of null operators, relies too heavily on case to be palatable to current thinking. One may challenge the idea that all complement positions are case-marked (especially with object control verbs, where the accusative case is taken by the direct object), and especially the assumption that PRO occurs in caseless positions (see Section 4.2).

Finally, consider the LFG approach to the issue. Recall that control in LFG is split to functional and anaphoric control (see Section 2.3). It is more or less stipulated that only subjects are susceptible to functional control (see Mohanan 1983: fn. 6). This kind of control applies to the open functions XCOMP and XADJ, which are defined as categories lacking a structural subject (Bresnan 1982: 359). Functional control of nonsubjects would involve a category whose open position is not a subject, a possibility not entertained in LFG.

One the other hand, anaphoric control is not similarly restricted. Just like anaphoric pronouns are not restricted to the subject position, the functional anaphor PRO need not be. Bresnan (1982: 380) assumes that any term function (SUBJ, OBJ or OBJ2) is available to PRO in principle, the choice being regulated by language-particular parameters. Thus, LFG explicitly entertains

the possibility of nonsubject controllees. In the next section we present data suggesting that this is a real linguistic option.

### *4.3.2 Nonsubject PRO: actor control in Tagalog*

The primary challenge to the claim that PRO must be a subject comes from Philippine languages. The most well-studied case is Tagalog, which I discuss here (Madurese is another case in point). Before looking at the control data, some background on the language is needed.

Tagalog has three case marker prefixes (NOM, DAT, GEN) and five verbal voices (AV – active voice, OV – objective voice, DV – dative/locative voice, IV – instrumental voice, BV – benefactive voice). The voice system is used to highlight the (nominative) subject, which is normally interpreted as definite. Notice that there is some disagreement among scholars of Philippine languages whether the voice system truly encodes grammatical functions, rather than discourse functions. For the time being I follow Kroeger 1993 in assuming the former, but I return later to the implications of alternative views.

It was Schachter (1976) who first characterized control in Tagalog in purely semantic terms. Schachter stated that the missing argument in control complements ("equi-clauses") is always the actor of the complement. Consider the examples (204a–204c), taken from Kroeger (1993: 39). The matrix verb is in the objective voice throughout. The embedded verb is in the active, instrumental and dative voice, respectively. The embedded actor is a subject in (204a), but not in (204b–204c), where 'money' and 'mother' are the subjects, respectively. Nevertheless, it is the Actor that is uniformly controlled in all three sentences (the PRO notation is mine).

(204) a. Binalak niya-ng [magbigay $PRO_{NOM}$ ng-pera
PERF.plan.OV 3SG.GEN-COMP **AV**.give GEN-money
sa-Nanay].
DAT-mother

b. Binalak niya-ng [ibigay $PRO_{GEN}$ sa-Nanay
PERF.plan.OV 3SG.GEN-COMP **IV**.give DAT-mother
ang-pera].
NOM-money

c. Binalak niya-ng [bigyan $PRO_{GEN}$ ng-pera
PERF.plan.OV 3SG.GEN-COMP **DV**.give GEN-money
ang-Nanay].
NOM-mother
'He planned to give mother (some/the) money.'

Drawing on previous work by Fodor (1974), Jackendoff (1983), Farkas (1988) and Sag and Pollard (1991), Kroeger suggests the following semantic constraints on control.

(205) a. Equi predicates require that their complements express a volitional action.
b. The controllee must be construed as the actor of that action.

Two notes are in order. First, the "equi predicates" in (205a) do not exhaust control predicates. They are limited to what Sag and Pollard called verbs of *commitment* (*promise*, *try* etc.) and verbs of *influence* (*order*, *force*, *ask* etc.). Verbs or orientation (*want*, *hope*, *insist* etc.) impose neither (205a) nor (205b) (e.g., *Jack wanted to have blue eyes*); see (206a). Second, apparent exceptions to (205b) are allowed under Sag and Pollard's (1991) "causative coercion," a semantic procedure that allows non-action complements to be controlled via an interpolated causer (see 5.1.2). This is possible in the non-volitive mood, which marks involuntary actions (lacking an Actor), as in (206b).

(206) a. Nagpilit si-Maria-ng [bigy-an $PRO_{NOM}$ ng-pera
PERF.AV.insist.on NOM-Maria-COMP give-DV
ni-Ben].
GEN-money GEN-Ben
'Mary insisted on being given money by Ben.'

b. In-utus-an ko si-Maria-ng [ma-halik-an $PRO_{NOM}$
PERF.order.DV 1SG.GEN NOM-Maria-COMP NONVOL.kiss.DV
ni-Pedro]
GEN-Pedro
'I ordered Maria (to allow herself) to be kissed by Pedro.'

(206a–206b) illustrate the two environments of *functional control* (in the LFG sense, see Section 2.3) in Tagalog. Verbs of orientation, as in (206a), being exempt from (205), only impose a syntactic constraint on the controllee: it must be a subject. Given that functional control involves total feature sharing, the controller too must be a subject. Verbs that do fall under (205), as in (206b), can only meet the semantic constraint via causative coercion. The controllee is a hidden causer, hence an actor, that causes/allows him/herself to engage in the involuntary action of the complement. Causative coercion must be triggered by the lack of an argumental actor, hence is tied to the nonvolitive mood. The result is again functional subject control, which, in this case, also obeys the semantic constraint.

As opposed to functional control in (206), the sentences in (204) illustrate *anaphoric control*. The controllee is a functional anaphor, PRO, which need not be a subject. Thus, anaphoric control in Tagalog targets a controllee which is semantically determined (as actor). However, Kroeger states that even anaphoric controllees must obey a more general condition – they must be terms (i.e., non-obliques). This condition explains why actor-control is so rare across languages. In English-type languages, actor participants are projected as terms only in subject position. Nonsubject Actors are necessarily oblique (e.g., a *by*-phrase). Tagalog is special precisely in that its voice alternations do not ever

demote arguments to oblique status; the genitive actors in (204b–204c) are still terms. Thus they are potential controllees even as nonsubjects.[18]

On Kroeger's analysis, then, subjecthood is not a universal feature of PRO (although *termhood* is). The strength of this claim, however, rests on the strength of two background assumptions. First, that the definition of subject is sufficiently narrow to exclude the controllees in (204b–204c). Second, that voice alternations in Tagalog indeed encode grammatical relations (and identify the subject) and not something else. Both assumptions have met with criticism, as we shall see below. If either type of critique proves compelling, it will be possible to preserve the subjecthood of PRO as a universal condition.

Falk (2006) argues that the SUBJ function of LFG is, in fact, not a primitive but an amalgam of two distinct functions – $\widehat{\text{GF}}$ and PIV(OT). The $\widehat{\text{GF}}$ of a predicate is the highest argument function on the relational hierarchy of the predicate's arguments: it will correspond to the agent of *buy*, the experiencer of *fear*, the possessor of *have*, the patient of *fall* etc. PIV is an overlay function, namely, it is assigned in parallel to other grammatical functions. Falk characterizes it as follows:

> The PIV is a kind of sentence-internal topic. Just as a discourse topic (represented in many languages as the grammatical function TOPIC) identifies a single participant as the common thread running through a discourse, the PIV is the common thread running through clauses that make up a sentence. Every clause in a syntactic structure (sentence) will have a PIV. (p. 76)

$\widehat{\text{GF}}$ and PIV divide up the traditional slew of "subject properties." While $\widehat{\text{GF}}$ encodes thematic prominence, null argument licensing and anaphora, PIV mediates interclausal dependencies like coordination, raising, extraction – and

[18] Sag and Pollard (1991) introduce EXT-ARG as a feature of content that identifies the controllee. A parameter sets this feature to "subject" in English and to "actor" in Tagalog. Kroeger's discussion, however, makes clear that both options should be available within Tagalog.

Davies (2005) reports that an alternation between actor and subject controllees is also attested in Madurese. Unlike in Tagalog, the same control verb may govern either type of control.

| | | |
|---|---|---|
| i. | [Maleng gila]i rowa nyajal [PRO$_i$ e-tangkep bi' polisi]. | *subject controllee* |
| | thief crazy that try.AV OV-catch with police | |
| | 'The crazy thief tried to be caught by the police.' | |
| ii. | Ali$_i$ nyajal [sapedha motor-ra e-pateppa' PRO$_i$] | *Actor controllee* |
| | Ali try.AV motorcycle-DEF OV-fix | |
| | 'Ali tried to fix his motorcycle.' | |

The matrix clauses in both sentences are in the active voice; the controller is both subject and Actor. In (i), the controllee is a theme "promoted" to subject by the objective voice. In (ii) the controllee is a non-subject Actor, the subject again being a promoted theme. Although the complete distribution of the two patterns in the language is not described, Davies mentions that the second one is more marked.

control. In uniform subject languages (like English), $\widehat{\text{GF}}$ and PIV coincide. In mixed subject languages, they can be assigned to distinct arguments. For example, in ergative languages, PIV is identified with OBJ, not with $\widehat{\text{GF}}$. The question what is the "true" subject of such languages is meaningless; subject properties are distributed between $\widehat{\text{GF}}$ and PIV. According to Falk, Tagalog reveals this split in a different way.

Falk suggests that the two types of control in LFG – anaphoric and functional control – are anchored to $\widehat{\text{GF}}$ and PIV, respectively. In anaphoric control, the matrix verb introduces no control equation. Control follows from the specification of "control pronoun properties" on an embedded GF. Given the relational hierarchy, the first candidate for control is the highest GF, $\widehat{\text{GF}}$. Moreover, the semantic constraints in (205) require an actor controllee, which is canonically mapped to $\widehat{\text{GF}}$. For this reason, the anaphoric controllee is commonly the embedded $\widehat{\text{GF}}$.

On the other hand, in functional control, control is induced by a control equation attached to the matrix verb. Such interclausal dependencies can only be mediated by the PIV function. Hence, the functional controllee is always the embedded PIV. Falk argues that some languages make a single choice: Inuit only employs anaphoric control of $\widehat{\text{GF}}$ and Balinese only employs functional control of PIV.

Returning to Tagalog, Falk accepts Kroeger's dual analysis with some modification. Specifically, Falk reaffirms that (204) exemplifies anaphoric control while (206) exemplifies functional control. Different from Kroeger, though, and in line with his own analysis of anaphoric control, Falk characterizes the controllee in (204) as $\widehat{\text{GF}}$, not as actor. This difference has deep implications. First, control in Tagalog is seen as fundamentally syntactic: although semantic constraints apply, the identification of the controllee is purely syntactic. Second, and more relevant to the title of this section – under Falk's theory the controllee in Tagalog is *always* a subject. Whether PIV in functional control or $\widehat{\text{GF}}$ in anaphoric control, the controllee counts as a subject – precisely because the very notion of subjecthood is decomposed into these two functions. Thus, the apparently innocent shift from "actor" to "$\widehat{\text{GF}}$" – if sustainable – may redeem the universality of the subjecthood property of PRO.

As a matter of fact, Kroeger's and Falk's analyses can be teased apart empirically. Notice that "actor" strongly correlates with "$\widehat{\text{GF}}$" but is not co-extensive with it (as Falk admits). Consider then a sentence where the matrix verb induces the semantic constraints (205), but the embedded verb is nonagentive. Furthermore, the intended controllee is neither an actor nor the $\widehat{\text{GF}}$.

(207) $\text{NP}_i$ V [V $\text{NP}_{\widehat{\text{GF}}\text{-PIV}}$ $\text{PRO}_i$]
(e.g., $\text{John}_i$ avoided [water splash on $\text{PRO}_i$], John avoided being splashed with water)

Kroeger's analysis predicts that under causative coercion, anaphoric control should be possible here (since PRO can be coerced into an actor role). Falk's analysis, in turn, rules out such sentences, since the controllee is neither a PIV nor a $\widehat{\text{GF}}$. Such examples, therefore, hold the key to the intriguing question of whether (a subcase of) Tagalog control can be described in purely semantic terms, without reference to subjecthood. Whether they are testable is an open question.

Finally, the relevance of the Tagalog control data to the issue of the subjecthood of PRO can be challenged from a wholly different angle. Throughout the discussion we have been assuming (with Kroeger 1993 and others) that voice alternations in Philippine languages encode grammatical relations; specifically, that the *ang*-marked DP is the subject. This view, however, is still debatable. A well-known alternative treats this DP as a topic (Carrier-Duncan 1985, Richards 2000), with the voice morphology seen as a species of *wh*-agreement (Pearson 2005). On the topic analysis, the embedded clauses in (204a–204c) are identical as far as the distribution of grammatical function is concerned. In particular, the embedded subject is always the actor. The differences among them concern the choice of the embedded topic, an $\bar{\text{A}}$-element which does not interact with control relations.

On this view, then, (204b–204c) are removed as potential challenges to the subjecthood of PRO. A new difficulty, however, arises with the sentences in (206), where the controllee is *not* the actor. It seems that one would be forced to analyze them as "topic-control." But control of topic, if real, falls outside standard control theory no less than control of actor. Thus, it remains to be seen whether the topic analysis of the "nominative" DP in Philippine languages can offer a more coherent account of the two control patterns attested in Tagalog than the subject analysis can.

## 4.4 Nullness of PRO

Like many other components of generative grammar, the theory of control was developed on the basis of English and European languages. In most of these languages, control always manifests itself as an asymmetrical relation between an overt controller and a null controllee. Thus, the question was hardly raised, before the 2000s, whether phonetic nullness is an inherent feature of the controlled element – an exceptionless requirement built into UG – or rather a statistically common feature at best. The assumption simply was that the nullness of the controllee is a universal property; differences existed only regarding whether this property was taken to be primitive or derivative. In the next two sections we will survey considerable empirical challenges to this traditional view. Before that, however, let us examine how the major approaches to control handled the nullness of PRO.

To begin with, any approach that takes control infinitives to be bare VPs trivially predicts the nullness of PRO (see Brame 1976, Bresnan 1978, Bach 1979, Chierchia 1984, Dowty 1985, Culicover and Wilkins 1986, Jacobson 1992, Jackendoff and Culicover 2003). More precisely, these approaches simply deny the existence of a syntactic subject position in control infinitives, hence cannot even contemplate the possibility of lexicalizing that position. If controlled subjects had been indeed universally null, then the VP-analysis would have definitely been vindicated in the strongest way. No other approach to control derives this prediction so smoothly. However, the force of the prediction is also the force of the refutation; solid evidence for overt controlled subjects would seem to spell doom for the VP-analysis.

Essentially the same remarks hold of the LFG theory of control (Bresnan 1982). Control infinitives are analyzed as bare VPs in c(onstituent)-structure. In functional control, the subject of the infinitive is shared with an argument of the matrix predicate – they are represented by a single element in f(unctional)-structure, which is mapped to the c-structure of the matrix clause but not to that of the infinitive. In anaphoric control, the subject of the infinitive is the "functional anaphor" PRO, again, absent from c-structure, which is further specified as [+U] (i.e., unpronounced), to be distinguished from overt pronouns. Since c-structure feeds morphology in LFG, and control infinitives are VPs in c-structure, an overt controllee is a theoretical impossibility.

The GB theory of control derives the nullness of PRO from the PRO theorem (Chomsky 1981). To recall, PRO in that theory is defined as [+anaphoric,+pronominal], a feature combination that yields a contradiction unless the element is ungoverned. The theory of case, in turn, requires (i) that every lexical (i.e. overt) NP bear case ("the case filter"); and (ii) that case be assigned under government. It follows that ungoverned elements cannot get case, hence cannot be lexical, due to the case filter. Thus, PRO must be null; any overt controllee is bound to remain fatally caseless.

Predicational theories of control – which grant infinitives a clausal structure – may seem less committed to the nullness of PRO. In fact, Williams (1980) treats PRO as a "predicate variable," not discussing how that guarantees its nullness. In Williams (1992), complement infinitives, subject infinitives and "logophoric" adjuncts are all excluded from the realm of predication, so their PRO subject no longer mediates predication. In general, it is possible to form complex predicates where the "predicate variable" is an overt pronoun; resumption and "copy raising" seem to utilize that function (e.g., *The cat which I'm not sure if* ***it*** *is brown or white*, *Mary felt like* ***she*** *was developing a flu*). Thus, provided other assumptions do not stand in the way, controlled pronouns are theoretically possible, perhaps even expected, under this theory. Controlled lexical DPs, on the other hand, would still seem to be impossible.

As to binding theories of control, the issue is how to distinguish overt anaphors from PRO, a null anaphor. A popular view in the 1980s relied on case. The subject position of infinitives was, by stipulation, caseless; null categories without case were (contextually) defined as anaphors (Manzini 1983, Bouchard 1984, Hornstein and Lightfoot 1987). Although rarely discussed, this left open the possibility for controlled lexical anaphors, should they find themselves in case positions. In other words, the nullness of the controllee in binding approaches was not axiomatic since it did not follow from anaphoricity as such but rather was "packaged" with it. Indeed, Borer (1989) unpacked these assumptions by locating the anaphoricity in the infinitival Agr, rather than in PRO. This allowed her to explicitly incorporate control of overt pronouns and anaphors, whose reference was parasitic on the Agr they were coindexed with.

Under the null case proposal, the nullness of PRO is guaranteed by stipulation: only the subject position of control infinitives receives null case, and only null case prevents lexicalization. This proposal, however, suffers from numerous independent problems, as discussed in Section 4.1.1, so lexical controllees, so to speak, are the least of its problems.

Within the Agree model of control, the nullness of PRO is stipulated, not derived. The crucial condition on the controlled subject is that it be referentially dependent, [–R] in Landau's (2000, 2004) terms. Landau (2006) allows for the possibility that overt anaphors, also marked [–R], would occur as controllees (as they do in Korean, see below). It would seem that even certain types of pronouns would be tolerated, if the Agree relation is mediated by Agr in C (similar to Borer's analysis) and the pronoun is derivationally "valued". What is much harder to imagine is a full lexical DP in the controlled position. A radical possibility, within this theory, is to allow Agree to transfer not just the abstract ϕ-features of the controller, but also its phonetic matrix.

A serious problem for *all* the above theories is raised by condition C of the binding theory. If the embedded controlled DP is not in a chain relation with the matrix controller (be it null or not), then it should behave like a bound R-expression and trigger a disjointness effect – just the opposite of the attested OC effect. This problem is elegantly solved in the movement theory of control (MTC), which is best equipped to handle overt controllees, particularly lexical ones (copy and backward control). We first present the data and then return to the MTC analysis.

### *4.4.1 Control of pronouns and reflexives*

Szabolcsi (2009) has argued that certain languages allow PRO under subject control to be realized as an overt nominative pronoun when it is modified by a scope-bearing element like *too* or *only*. The reading thus obtained cannot

be rendered unambiguously otherwise. According to Szabolsci, the critical parameter permitting such constructions is the ability of the finite inflection to enter multiple Agree relations (and nominative case assignment) with both the matrix and the embedded subjects. For this reason, this option is available in subject but not in object control.

(208) Szeretnék [csak én magas lenni]. *Hungarian*
would.like.1SG only I tall be.INF
'I want it to be the case that only I am tall.'

At least in Hungarian and Italian (and possibly in other languages), Szabolcsi shows convincingly that the "*only*/*too* pronoun" constituent is the embedded subject, ruling out the option of an emphatic pronominal double (as in Romanian and Serbo-Croatian, see Comorovski 1985, Zec 1987). The same analysis has been proposed for parallel constructions in European Portuguese by Barbosa (2009) (see (67b)/(71b) above).

In addition, overt anaphors (and possibly pronouns) occur as the subjects of OC complements in Korean, Japanese and Chinese (Yang 1985, Borer 1989, Madigan 2008a, Lee 2009). Normally, these long-distance reflexive elements accept any c-commanding subject as their antecedent. In OC contexts, however, they must be bound by the local controller, even when it is not a subject, confirming that they are truly "lexicalized" PRO elements.[19]

(209) a. *Korean*
Inho$_i$-ka Jwuhi$_j$-eykey PRO$_{j/*i}$ / **caki$_{j/*i}$-ka** cip-ey
Inho-NOM Jwuhi-DAT self-NOM home-LOC
ka-la-ko mal-ha-yess-la.
go-IMP-C tell-do-PST-DC
'Inho told Jwuhi to go home.'

b. *Japanese*
Sachie$_i$-ga Karthik$_j$-ni PRO$_{j/*i}$ / **zibun$_{j/*i}$-ga** shukudai-o
Sachie-NOM Karthik-DAT self-NOM homework-ACC
shi-ro-to meeree-shi-ta.
do-IMP-C order-do-DC
'Sachie ordered Karthik to do the homework.'

c. *Chinese*
Zhangsan$_i$ bi Lisi$_j$ PRO$_{j/*i}$ **/ziji$_{j/*i}$** xie zuoye.
Zhangsan force Lisi self write homework
'Zhangsan forced Lisi to do the homework.'

[19] The data in (209) are from Madigan 2008a. Yang 1985 claimed that the reflexive elements cannot be controlled by objects and that the Korean third person pronoun *ku* is also controllable. Madigan rejects both these claims on empirical grounds, but shows that first and second person pronouns are also controllable.

Madigan (2008b) claims that the reflexive examples differ from the PRO-examples in that they carry an exhaustive focus interpretation for the controlled subject (e.g., *only* Jwuhi should go home in (209a)). This is quite similar to the condition identified by Szabolcsi (2009), whereby the controlled pronominal subject must be scopal (and indeed, occupies the preverbal focus position in Hungarian). The possibility remains, however, that the overt controlled reflexives and pronouns are emphatic doubles, in which case these data would not challenge the nullness of PRO.[20] Indeed, the claim that the reflexive *caki* can lexicalize PRO in Korean has been disputed in Lee 2009: 180–184. Lee points out that *caki* is more restrictive than PRO in split control contexts and less restrictive than PRO in allowing long-distance binding in some OC contexts. Overall, the precise status of overt controlled subjects in South East Asian languages is not settled yet.

### *4.4.2 Backward and copy control*

The second phenomenon involves OC with an overt controlled DP – so-called backward and copy control constructions (see Polinsky and Potsdam 2006 for a useful survey). In a few languages and constructions, the overt DP shows up in the controlled position, whereas the controller position is either empty (backward control) or filled with an identical DP (copy control) (II/III in (210a) are noun class agreement markers).

(210) *Backward control: Tsez* (Polinsky and Potsdam 2002)

a. $\Delta_1$ [ kid-ba$_1$ ziya b-išra] y-oq-si.
II.ABS girl.II-ERG cow.III.ABS III-feed.INF II-begin-PAST.EVID
'The girl began to feed the cow.'

*Copy control: San Lucas Quiavini Zapotec* (Lee 2003)

b. R-càà'z Lia Paamm [g-ahcnèe Lia Paamm Gye'eihly].
HAB-want FEM Pam IRR-help FEM Pam Mike
'Pam wants to help Mike.'

There is solid evidence that these constructions (especially the backward control cases) possess the OC signature, except for the unusual property that the controlled position is spelled out. Furthermore, constituency tests, scrambling and adverb placement establish that backward control sentences like (210a) are biclausal, that the overt subject is contained in the embedded clause, and that the matrix clause contains an empty category coindexed with the embedded subject. The presence of the latter can be detected by matrix elements that

[20] Levinson (1987) argued that overt pronouns occur in controlled positions in the Australian language Guugu Yimidhirr. However, "control" seems to be a misnomer for the referential dependencies he studied, which are, as he stressed, only preferential.

depend for their licensing on a clausemate syntactic DP. In (211a) the matrix null controller binds a matrix anaphor and in (211b) it licenses a secondary predicate.

(211) a. *Tsez* (Polinsky and Potsdam 2002)
Δ$_i$ nesā nesir [ibrahin-ā halmaɣ-or ɣutku rod-a]
REFL.I.DAT Ibrahim.I-ERG friend.DAT house.ABS make.INF
Ø-oq-si.
I-begin-PAST.EVID
'Ibrahim began, for himself, to build a house for his friend.'

b. *Greek (Alexiadou et al. 2010)*
Thimithike Δ$_i$ panikovlitos [ na svisi o Janis$_i$ to fos].
remembered.3SG panicking.M PRT switch.off Janis the light
'Janis remembered in panic to switch off the light.'

The crosslinguistic manifestation of backward control is somewhat erratic, and empirically unsettled. Most languages simply do not allow it. Of the languages that do, many (like Tsez) only exhibit backward control with a handful of verbs, often the aspectual verbs *begin*, *stop* and *continue*, which are ambiguous between a raising and a control reading. With these verbs, backward control is the only control option (standard, forward control being excluded). On the other hand, Greek and Romanian appear to allow free variation between backward and forward control (up to different focus structures) with *all* the verbs that select control complements in the language; the same is true of object control in Malagasy.[21]

Japanese also exhibits backward control, although the exact extent of the phenomenon is under dispute. Fujii (2006) argues that only two verbs in the language (*assist* and *disrupt*) display genuine backward control, which may alternate with forward control under certain circumstances. The original candidate for backward control in the language – the *tokoro*-construction (Harada 1973, Kuroda 1978, Narita 2007) – is probably misanalyzed as such (see Yoshimoto 2011). Finally, in Korean a single verb (*persuade*) was argued to alternate between forward and backward object control.[22]

### *Further reading*

For relevant works on the topic of Section 4.4.2, see Harada 1973, Kuroda 1978, Farrell 1995, Polinsky and Potsdam 2002, 2003, 2006, Lee 2003,

[21] Recall from Section 4.1.2 that these complements are subjunctive. The existence of backward control in Romanian has been put to question in Jordan (2010).

[22] The proper analysis of this single verb, which takes a *tolok*-complement, has produced a lively debate; see Monahan 2003, 2005, Cormack and Smith 2004, Choe 2006, Polinsky 2007, Madigan 2008a: 88–104. The final verdict, issued by former advocates of backward control in Korean, seems to deny its existence altogether (Kwon, Monahan and Polinsky 2010).

Monahan 2003, 2005, Fujii 2006, Sells 2006, Alboiu 2007, Haddad 2007, 2009, Narita 2007, Fukuda 2008, Potsdam 2009, Kwon, Monahan and Polinsky 2010, Alexiadou et al. 2010, Jordan 2010, Yoshimoto 2011.

### *4.4.3 Theoretical implications*

If anything, backward (and copy) control proves that controlled clauses contain syntactic subjects. Thus, these phenomena drive the final nail in the coffin of the subclausal analyses of control infinitives. Yet they present a novel challenge to all the major approaches to control: how can the controlled element be pronounced? Indeed, as discussed in Section 4.4, the nullness of PRO is a cornerstone of most of these approaches. While some theories can accommodate controlled pronouns and anaphors, dealing with controlled lexical DPs is much harder.

Currently, the Movement Theory of Control (MTC) offers the most principled account of backward control. In this theory, to recall, the control dependency is an A-chain headed by the controller. In normal forward control, the head of the chain is pronounced. In backward control, however, a lower (intermediate) link is pronounced. Thus, the two patterns are seen as two different pronunciations of the same LF structure, on a par with other overt-covert alternations (e.g., in the domain of *wh*-movement).

(212) a. *Forward control*
[$_{TP}$ John [$_{T'}$ T [$_{vP}$ ~~John~~ v [$_{VP}$ tried [$_{TP}$ ~~John~~ to [$_{vP}$ ~~John~~ swim]]]]]].

b. *Backward control*
[$_{TP}$ ~~John~~ [$_{T'}$ T [$_{vP}$ ~~John~~ v [$_{VP}$ tried [$_{TP}$ John to [$_{vP}$ ~~John~~ swim]]]]]].

Note that the matrix copy of the controller is syntactically *and* semantically active; it triggers matrix agreement, binds matrix anaphors etc. In that sense, backward control is different from long-distance agreement in expletive-associate pairs, where the LF-visible position of the associate is its surface, low position (den Dikken 1995a). It is also different from the more familiar covert movement that affects LF configurations, Quantifier-Raising, which is Ā-movement. Depending on whether or not raising to object ever occurs covertly (see Runner 2006 for some discussion), backward control may be a rare instance of covert A-movement.

The key theoretical question within the MTC is how the spellout options of the controller are fixed. Given that pronunciation of DPs is governed by case in the MTC, the question boils down to this: what patterns of case checking obtain in backward control? There seem to be two options. The conservative option (proposed in Polinsky and Potsdam 2002) is to assume that the overt position (the embedded subject) is case marked and the covert one (the matrix subject or object) is not. Here, pronounceability is directly tied to case. If

V-to-T movement can satisfy EPP in the matrix clause (as in Alexiadou and Anagnostpoulou 1998), then it should block DP raising to the subject position, being more local. Consequently, forward control is excluded. The main problem with these proposals is the solid evidence for structural case checking *both* in the embedded clause and in the matrix clause, in the same control chain (e.g., absolutive agreement in (210a), (211a); see Landau 2007 for discussion).

A more radical option is to acknowledge multiple case-marked A-chains (Bejar and Massam 1999), such that the embedded overt subject gets one case and the covert matrix controller gets another case (see Monahan 2003, Polinsky and Potsdam 2003, Alexiadou et al. 2010). Under this scenario, one expects, and indeed finds (in Malagasy and in Greek and Romanian), an alternation between forward and backward control (in fact, copy control necessitates multiple case checking in a chain). Although not clearly explained in syntactic terms (presumably, neither option is derivationally more economical), perhaps the two choices reflect different topic-focus articulations (Alboiu 2007, Madigan 2008b). One problem with this approach is that a higher structural case appears to be able to "overwrite" a lower inherent/quirky case (see also Fujii's 2006 analysis, in which the lower nominative case is "inherent"), as in the following Greek example.

(213) ? Tolmise $\Delta_i$ [na tis aresun tis Marias$_i$ i
dared.3SG PRT CL.GEN please.3PL the Mary.GEN the
operas].
operas.NOM
'Mary dared to like operas.'

According to Alexiadou et al.'s analysis, the empty category $\Delta_i$ (an unpronounced copy) in the matrix clause is assigned nominative case by the matrix finite T, even though the lower link in the chain *Marias* is genitive (the nominative on *operas* is assigned by the embedded subjunctive T). Just this type of multiple case-marking is never available in standard A-chains, in which the low quirky case is always preserved in higher positions (see Davies 1988, Bobaljik and Landau 2009 for discussion of this point in relation to control; and Section 4.2). A more fundamental issue concerns the very effect of OC. If structural case is available both in the embedded subject position and in the matrix controller position, nothing seems to prevent merging two independent DPs in these positions, each checking its own θ- and case features and bearing no referential dependency to the other. Obviously, this never happens in normal OC constructions.

An account of backward control within LFG is presented in Sells 2006. Sells acknowledges that the phenomenon calls for a revision of the traditional LFG notion that XCOMP categories map to VPs in c-structure; backward controlled complements, hosting a lexical subject, must be full clauses at c-structure.

More fundamentally, the symmetric relation of structure-sharing (equality) is replaced by an asymmetric relation of *subsumption*, where one f-structure is a subset of another one, hence subsumes it (being more general). In forward control, information flows down: SUBJ $\sqsubseteq$ XCOMP SUBJ. In backward control, information flows up: XCOMP SUBJ $\sqsubseteq$ SUBJ. The possibility of multiple case is accommodated by excluding CASE attributes from f-structures.

As a final note, there is currently no theoretical link between backward/copy control and pronoun/reflexive control. The phenomenon documented in Szabolcsi (2009), of controlled "scopal" pronouns (see (208) above), is not only distinct from backward control, but potentially at odds with it. First, it is linked to nominative case, thus unavailable in object control (at least in Hungarian). Second, the controlled subject is crucially a pronoun and cannot be a lexical DP, an outcome of binding condition C, according to Szabolcsi (by contrast, raising predicates allow the embedded subject to be a lexical DP). Third, unlike in genuine backward control, the embedded subject takes scope strictly within the complement clause, showing no sign of matrix activity. In all these respects, these data fall together with Korean controlled pronouns/reflexives and not with backward control.

# 5 The phenomenology of obligatory control

## 5.1 Controller choice and control shift

One hallmark of OC is locality: the controller DP must occur in the clause immediately dominating the clause whose subject is controlled. More precisely, the controller and the infinitive must be co-arguments (of the control predicate). In Chapter 2 we have seen that there are various ways to accomplish this locality, either in lexical or syntactic terms. Yet the property of locality only goes half way to explain the choice of particular controllers in a particular sentence. This is so because often there are two matrix arguments, besides the infinitive, which satisfy the locality condition. And as we will shortly see, the choice between them is not arbitrary. Consider the logical possibilities, where $DP_i$ is the matrix subject and $DP_j$ the matrix object (direct, indirect or oblique).

(214) *Possibilities of controller choice*
a. $DP_i \ldots [PRO_{i/*k}\ VP]]$
b. $DP_i \ldots DP_j\ [PRO_{i/*j/*k}\ VP]]$
c. $DP_i \ldots DP_j\ [PRO_{*i/j/*k}\ VP]]$
d. $DP_i \ldots DP_j\ [PRO_{i/j/*k}\ VP]]$

Control by an extrasentential or arbitrary antecedent (index *k*) is excluded throughout. Dyadic verbs, selecting a subject and an infinitive only, necessarily fall under subject control (214a). Certain triadic verbs, which select an object as well, also show subject control (214b). Other triadic verbs only allow object control (214c). Finally, a few triadic verbs allow either subject or object control, depending on context, (214d) (the last ones typically allow split control as well; see Section 5.3). These options are illustrated for English below.

(215) a. John tried [PRO to save himself/*oneself].
b. John promised Mary [PRO to save himself/*herself/*oneself].
c. John persuaded Mary [PRO to save herself/*himself/*oneself].
d. John proposed to Mary [PRO to save himself/herself/*oneself].

It is a striking observation that the same verbs cluster with *try*, *promise*, *persuade* and *propose* across languages. In other words, control verbs fall into semantically coherent classes; the class membership of a particular verb

reliably predicts whether it will display subject, object or variable control. From the lexical-semantic point of view, the problem of controller choice translates to the problem of finding the right semantic factorization of control verbs.[1]

In Section 5.1.1 I present a variety of approaches to this problem, laid out chronologically, and highlight their merits and faults. Section 5.1.2 discusses an interesting challenge to these approaches – the phenomenon of control shift, whereby manipulation of the complement infinitive affects the choice of controller. Section 5.1.3 turns to the syntactic account of controller choice, based on the Minimal Distance Principle (MDP) of Rosenbaum (1967, 1970) and his successors, pointing out its fundamental inadequacy.

### *5.1.1 Theories of controller choice*

The first attempt in generative grammar to understand the semantic principles underlying controller choice is, to my knowledge, by Postal (1970). Postal's insights did not receive due attention in the following years (but see Petter 1998: 234–235), although they hold much interest for current theories that still grapple with this difficult issue.

Postal's observations were made in the context of his broader aim, which was to argue against the Equi-NP Deletion analysis and in favor of a pronominalization analysis of the deleted controlled subject (see Section 1.1). For this purpose he assembled a number of analogies between PRO (=the controlled subject) and overt pronouns. One major analogy concerned the coreference conditions on these elements.

Postal's starting point was that many ditransitive verbs of communication may take either a finite or an infinitival complement. Furthermore, the type of finite complement closest in meaning to the infinitive contains a modal – either *ought to/should* or *will/would*. The interesting fact is that the same matrix argument that is chosen as the controller of PRO in an infinitival complement is the favored or even only antecedent for an embedded pronominal subject in the modal finite complement.

[1] That said, there are reported cases where the controller of a complement is not obviously selected on semantic grounds. Chang and Tsai (2001) discuss several Formosan languages (e.g., Kavalan) where the controller is uniformly the Actor-Subject. In order to express standard object control, the complement verb is causativized. The analogue of *I persuaded the child to leave* would literally be "I persuaded the child that I cause him/her to leave". Although Chang and Tsai describe the phenomenon as *actor*-sensitive choice of controller, their data are fully compatible with *subject*-sensitive choice (as in Stiebels' (2007) interpretation). Interactions of control with the active/non-active voice system suggest that interpretation as well, but without further study, the issue is moot.

(216) a. $\text{Harry}_j$ told $\text{Max}_i$ [$\text{PRO}_{i/*j}$ to enlist in the army].
b. $\text{Harry}_j$ told $\text{Max}_i$ [that $\text{he}_{i/*j}$ ought to/should enlist in the army].
c. $\text{George}_j$ asked $\text{Bill}_i$ [$\text{PRO}_{i/*j}$ to help Mary].
d. $\text{George}_j$ asked $\text{Bill}_i$ [if $\text{he}_{i/*j}$ would help Mary].
e. $\text{Bill}_j$ asked $\text{Tom}_i$ [when $\text{PRO}_{*i/j}$ to fire the canon].
f. $\text{Bill}_j$ asked $\text{Tom}_i$ [when $\text{he}_{*i/j}$ should fire the canon].

Note that the indicated judgments in (216b, 216d, 216f) hold only when the finite complements are assigned a very specific illocutionary force (which is always nondeclarative): namely, imperative, request and question, respectively. This led Postal to suggest that the superficial "modal constraints" reflect an underlying direct discourse (DD) structure, related to the indirect discourse (ID) infinitival complements.

(217) a. Harry told Betty to marry him / (You) marry me, Harry told Betty.
b. Harry asked Betty to marry him / Will you (please) marry me, Harry asked Betty.
c. Harry promised Betty to leave / I will leave, Harry promised Mary.
d. Harry asked Betty when to leave / When should I leave, Harry asked Betty.

The emerging generalization about controller choice is very clear: if the DD subject is second person, the ID subject (PRO) is object-controlled; if the DD subject is first person, the ID subject is subject-controlled.

Postal leaves undiscussed the derivational analysis of these correlations, and one can imagine different ways of implementing such an analysis. The important lessons from his discussion, though, are (i) semantic generalizations govern the reference of PRO in OC; (ii) these generalizations are couched in the meaning of the control verb and in the meaning of modal/DD complements; (iii) subject control across an object (e.g., (217c–217d)) is fully predictable and not an exception (as in the MDP analysis, see Section 5.1.3). These lessons were fully or partially incorporated in subsequent theories.

During the early 1970s, the popular view on controller choice was that it is based on some system of thematic roles (Jackendoff 1972, 1974). This view was further refined in the 1980s. Matching conditions on the θ-roles of the controller and PRO figure in Růžička 1983 and Melvold 1985. Růžička proposes that *promise*-type verbs impose thematic identity between the controller and PRO whereas *persuade*-type verbs impose thematic distinctness. This captures some interesting interactions of embedded passivization with control shift. Melvold suggests that control verbs induce "thematic binding" relations, where (the arguments associated with) matrix θ-roles bind (the arguments associated with) embedded θ-roles. For *promise*, the matrix agent binds the embedded agent and the matrix goal binds the embedded benefactive; the latter relation licenses control shift. Both accounts suffer from the inherent vagueness of θ-roles, which

invites unwieldy adjustments (an undefined notion of "thematic similarity" for Růžička and an unconstrained process of "thematic overlay" for Melvold).

Chierchia (1984) assigns the task of controller selection to a thematic hierarchy of the following sort: Theme > Source > Goal > . . . θ. The control entailment (see (114) above) picks as controller that matrix argument whose θ-role is highest on the hierarchy. Thus, *persuade* is predicted to exhibit object (=Theme) control and not subject (=Agent) control, due to this hierarchy. The problem with this account, as noted by Farkas (1988) and Sag and Pollard (1991), is that the thematic hierarchy only provides a markedness scale (as Chierchia acknowledges), and must tolerate quite a few exceptions. In particular, many Source-Goal verbs (*tell*, *order* etc.) seem to violate it, selecting a Goal over a Source controller.[2]

Responding to the limits of thematic hierarchies (Chierchia 1984) or GF hierarchies (Bresnan 1982) in properly characterizing controller choice, Farkas (1988) proposes a new semantic notion – the RESP(onsibility) relation. RESP(i,s) holds between an initiator i and a situation s just in case i intentionally brings about s.

Farkas argues that RESP is motivated independently of control, governing the felicity of rationale clauses, positive imperatives and the adverb *intentionally*. Furthermore, an initiator of s need not be the agent of s; indeed, agentless situations may have initiators that are not syntactically represented. The following examples illustrate these properties:

(218) a. The shop window has a big sale sign in it in order to attract customers.
b. # John resembles his father in order to annoy his grandmother.

(219) a. Be polite!
b. # Be tall!

(220) a. John was intentionally seen by the best specialist.
b. # John was intentionally watched by his neighbors.[3]

According to Farkas, the (a) examples above instantiate situations that, given our assumptions about the world, can be intentionally brought about; they therefore satisfy the RESP relation with regard to some initiator; whereas the (b) examples involve situations that fail to meet this condition. "Initiator" often

[2] A θ-hierarchy also determines the controller in Nishigauchi's (1984) theory. Nishigauchi defines the *primary location* to be the highest θ-role in the hierarchy: Goal > Location, Source. The primary location is chosen as the controller in a number of constructions, including purpose clauses, interrogative complements, infinitival relatives and infinitival complements to nouns. In Xu 1986, θ-roles of particular verbs are assigned "control selectional features," [±obligatrory coreference] and [±preferable coreference], which determine whether the verb induces OC and if so, which argument controls. The distribution of these diacritic marks, however, is stipulated.

[3] The "#" mark refers to the subject-oriented reading of the adverb.

coincides with a grammatical agent, but does not have to, as these examples suggest.

The claim is that in the unmarked case, the controller of the situation described in the infinitive is the initiator of the situation, namely, the individual standing in the RESP relation to it. Farkas argues that this concept covers both *promise*-type and *persuade*-type verbs, explaining the parallels between the above observations and (221).[4]

(221) # John promised / persuaded Pete to resemble Bill / be tall.

Furthermore, for some verbs (like *require*), RESP is induced even with finite complements, where no control is involved.

Farkas' analysis has certain undeniable advantages. First, it goes way beyond the previous thematic analyses in characterizing the fine-grained semantics of OC. Furthermore, it is the first proposal in the literature that achieves an impressive goal, that of unifying subject control and object control under a single explanatory principle. As Farkas notes, under this theory it is no longer a coincidence that crosslinguistically, verbs that roughly mean *promise* induce subject control, whereas verbs that roughly mean *persuade* induce object control.

One conceptual weakness in Farkas' principle of controller choice is the unmotivated role syntax plays in it. Although the requirement that the initiator be an argument of the control verb is built into the principle of controller choice, it seems rather arbitrary, given that initiators (as Farkas shows) are not in general subject to conditions of syntactic locality. As opposed to theories where the relation between the infinitive and the controller is represented at some syntactic level where natural *domains* can be defined (θ/GF-structure), the semantic relation RESP has no syntactic correlate. This renders the locality of OC quite accidental under Farkas' theory. To illustrate, consider (222).

(222) Harry$_1$ knew that Fred$_2$ owed some money to Richard, so he$_1$ gave him$_2$ a loan to settle this. Fred$_2$ then promised Richard [PRO$_{*1/2}$ to pay back his debt].

In this scenario, *Harry* is the initiator of the situation described in the bracketed infinitive, intentionally bringing it about; yet he cannot control PRO, only *Fred* can. In Farkas' theory, this result is obtained by brute stipulation, somewhat weakening the analogy between OC and other manifestations of the purported RESP relation in the grammar.

The idea that a single semantic notion can capture both subject and object control is explicitly abandoned in Sag and Pollard (1991) (henceforth S&P). Building on Jackendoff's ideas, S&P propose a three-way classification of

[4] This echoes Lasnik and Fiengo's (1974) observation that infinitival complements to verbs like *try* and *convince* must denote "controllable actions." See also Comrie 1984 for a similar idea.

control verbs (*soa* below stands for "state of affairs," the semantic role of the nonfinite complement).

(223) *S&P classification of control verbs*
a. Influence: <influence, influenced, soa>
E.g.: *persuade*, *order*, *advise*, *forbid*, *propel*, *ask*, *allow*, *instruct*, *signal* etc.
b. Commitment: <committor, (commissee), soa>
E.g.: *promise*, *swear*, *agree*, *contract*, *pledge*, *vow*, *demand*, *refuse* etc.
c. Orientation: <experiencer, soa>
E.g.: *want*, *wish*, *hope*, *hate*, *expect*, *aspire*, *need*, *long* etc.

The second component of the theory selects the controller on the basis of the semantic roles associated with each class.[5]

(224) *S&P's principle of controller choice*
Given a nonfinite VP or predicative complement C whose semantic content C' is the soa argument of a soa s whose relation is R, the unexpressed subject of C is linked to:
A: the influenced participant of s, if R is of the influence type.
B: the committor participant of s, if R is of the commitment type.
C: the experiencer participant of s, if R is of orientation type.

Two features of this theory are worth highlighting. First, subject control across an object (e.g., with *promise*, *vow*, *contract*, *pledge* etc.) is not perceived as an anomaly, as it was in the MDP tradition (see Section 5.1.3). Whenever there is a commitment, the committor will be selected as a controller, regardless of the presence or absence of another argument (goal/addressee/commissee). Second, the choice of controller is wholly semantic, hence oblivious to the syntactic context of the controller and the infinitive. This allows S&P to capture the uniformity in controller choice across a wide range of constructions.

(225) a. Sandy's promise to Tracy to leave the party early caused quite an uproar.
b. The promise by Sandy to leave the party early caused quite an uproar.
c. The promise that Sandy made, to leave the party early, caused quite an uproar.
d. The promise to leave the party early, which Kim knew would be immediately forthcoming from Sandy, was going to cause quite an uproar.
e. A: Sandy made Tracy a promise.
B: What was it?
A: I think it was to leave the party early.

[5] (224) abstracts away from two other aspects of control in HPSG; the assignment of the unexpressed subject to the type *refl* (anaphor) and the identification of the controllee as an 'external argument,' rather than a subject. These aspects make no difference in the present context (see Section 2.2 and Chapter 4, fn. 18).

The controller in (225a–225d) (the person to leave the party early) is found in various positions within an NP, which also contains the infinitive. In (225e) the controller and the infinitive are distributed across discourse. Yet in all these cases the choice of controller is invariant: it is the person making the promise, namely Sandy. In S&P's words: "Controller assignment principles are tied to the soas described by linguistic expressions rather than to linguistic expressions themselves" (p. 71).

While there is little doubt that semantic generalizations underlie controller choice, the question is whether S&P's semantic classes deliver the right results. First, note that given the locality of OC, which is independently guaranteed (even on S&P's theory, where the controllee is subject to binding condition A), the issue of controller choice only arises with triadic verbs. For these, the larger class is named by S&P *influence*. In fact, S&P do not provide anything beyond intuition in the way of classifying verbs under "influence" ("a certain participant is influenced by another participant," p. 66). This is rather vague. Consider the fact that *ask* (being object control) must be of the influence type and *agree* (being subject control) must be of the commitment type. S&P would have to claim that *Mary* is influenced in (226a) but not in (226b). This is clearly not how we use *influence* in normal language (and S&P have provided no alternative, technical sense): a person being asked something is in no way necessarily influenced by the request (to see this more clearly, replace *Mary* in (226a) with *The Virgin Mary*). If anything, *Mary* is more influenced in (226b), being a party to an agreement, yet that does not allow object control.

(226) a. John asked Mary to help him.
b. John agreed with Mary to help her.

These are just examples; the general point is that contrary to repeated declarations in the semantic camp that controller choice is "obviously" handled in the semantics, we are still short of an explicit, sufficiently fine-grained theory that explains this "obvious" fact.[6]

[6] An attempt to simplify the three-way disjunction in (224) is offered in Farrell 1993. Farrell points out that the question of controller choice only arises for commitment and influence verbs, which are possibly triadic (with two matrix arguments), and not for orientation verbs, which are dyadic (with a single matrix argument). He then claims that the different choice of controller for the first two verb classes is a derivative of an independent distinction between them: the object of commitment verbs is not an affected object whereas that of influence verbs is, as the contrast below reveals. Following Jackendoff's 1990 conceptual structure analysis, both the subject and the object of influence verbs are represented as arguments of AFFECT on the action tier, whereas only the subject, but not the object of commitment verbs is so represented. The principle of controller choice then selects as controller the affected argument, if there is one; otherwise, it selects the actor.

i. What I did to *those guys* was force *them* to finish the job.
ii. * What I did to *those guys* was promise *them* to finish the job.

An alternative analysis of controller choice in terms of semantic selection is developed in Rooryck 2000, 2007. Rooryck's basic insight is that the choice of controller "piggybacks" the selectional relation between the fine-grained event structure of the control verb and the temporal feature of the infinitival C head. The link between temporal selection and referential anchoring of PRO is provided by the infinitival Agr, which is assumed to be an anaphor, as in Borer 1989.

Rooryck restricts his discussion to triadic verbs, where the choice of controller (between matrix subject and object) is not trivial. A basic assumption is that they all involve a <Source,Goal,Theme> thematic structure, where the two matrix arguments correspond to the Source and Goal, and the infinitive corresponds to the Theme. These verbs denote abstract "transfer" of the Theme from the Source to the Goal. Unlike S&P, Rooryck classifies control verbs into *four* major classes.

(227) *Actual transfer: strict object control*
give, grant, force, coerce, compel, impose, prevent, praise, punish . . .
a. $\text{Kim}_i$ forced $\text{Sandy}_j$ [$\text{PRO}_{j/*i}$ to do the dishes].
b. $\text{Kim}_i$ praised $\text{Sandy}_j$ for [$\text{PRO}_{j/*i}$ doing the dishes].
c. $\text{Kim}_i$ forced $\text{Sandy}_j$ [$\text{PRO}_{j/*i}$ to be allowed do the dishes].
d. $\text{Kim}_i$ praised $\text{Sandy}_j$ for [$\text{PRO}_{j/*i}$ being allowed to do the dishes].

(228) *Tentative transfer: variable control*
propose, offer, suggest
a. $\text{Kim}_i$ proposed to $\text{Sandy}_j$ [$\text{PRO}_{i/j/i+j}$ to do the dishes].

(229) *Delayed transfer: preferential subject control*
Promise, guarantee, threaten
a. $\text{Kim}_i$ promised $\text{Sandy}_j$ [$\text{PRO}_{i/*j}$ to do the dishes].
b. $\text{Kim}_i$ promised $\text{Sandy}_j$ [$\text{PRO}_{j/*i}$ to be allowed do the dishes].

(230) *Delayed transfer: preferential object control*
ask, beg, request
a. $\text{Kim}_i$ asked $\text{Sandy}_j$ [$\text{PRO}_{j/*i}$ to do the dishes].
b. $\text{Kim}_i$ asked $\text{Sandy}_j$ [$\text{PRO}_{i/*j}$ to be allowed do the dishes].

Following Pustejovsky 1988, Rooryck analyzes transfer events as *transitions*, consisting of two consecutive subevents (this category encompasses both Vendler's accomplishments and achievements). Subevents themselves are either [+realized] or not. [–realized] subevents are either (i) not linked to a specific

The problem here, already hinted in (226), is that many object control verbs fail the test in (i), the matrix object not being affected in the relevant sense.

i. * What I did to *those guys* was tell/ask *them* to finish the job.
ii. * What I did to *those guys* was recommend/signal to *them* to finish the job.

Thus, object affectedness seems to be sufficient but not necessary for object control.

point in the temporal development of the verb; e.g., states; or (ii) linked to a possible future relative to the event time; e.g., resultant states. The notion of [–realized] event is central in Rooryck's analysis of control.

Next, Rooryck follows Bresnan 1972 and Stowell 1982 in assuming that the tense of infinitives is [–realized]; furthermore, this temporal feature is also present on the infinitival C and is selected (or identified) by the [–realized] subevent of the matrix verb. The way control is established is as follows: the infinitival C carries not just T-features but also anaphoric Agr-features. Identification of $T_{[-realized]}$ in C by the matrix [–realized] subevent entails identification (coindexing) of the anaphoric Agr in C by the ϕ-features of all and only the arguments contained in the [–realized] subevent of the matrix verb.

This apparatus is put to use to derive the different patterns of control in (227)–(230). Without detailing the actual event representations assumed by Rooryck, the idea is that the [–realized] event in actual transfer verbs contains a single argument – the matrix object; e.g., in (227a) it is the (unrealized) event of 'do-the-dishes(Sandy).' The other three verb classes involve a more complex [–realized] event. Intuitively, this is so because their [+realized] event is merely a mental/verbal act (or proposing, promising or asking), and the subsequent [–realized] subevent contains both an action (on the part of the Source) and a resultant state, in which the Goal has the Theme (i.e., the event denoted by the infinitive). As a result, the [–realized] subevent of the verbs in (228)–(230) contains *two* potential controllers, the Source or the Goal.

This indeed allows for variable control in (228) but does not explain the preferential patterns in (229)–(230). To explain these, Rooryck appeals to a thematic hierarchy sensitive to Dowty's 1991 notion of Proto-agent. The subject of *promise* (the Source) is associated with *volition*, unlike its object; hence it is more "agent-like" and the preferred controller. The object of *ask* is associated with *causation* and *movement* (of the unrealized Theme), which together make it more agentive than the volitional subject; hence the object is the preferred controller. Finally, control shift as in (229b)/(230b) is forced when the preferred controller is no longer a possible choice; as the understood implicit agent of the embedded passive, it cannot also be the surface subject (e.g., **Kim was allowed by herself to do the dishes*).

The grammatical machinery developed in Rooryck 2000 is fairly intricate, and I do not wish to comment on its technical aspects here. Instead I would like to point out several difficulties for this analysis that are relatively theory-neutral.

One fundamental question concerns modularity. Rooryck assumes that entities within Pustejovsky-style event decomposition are syntactically active elements; in particular, they interact with agreement and indexing. This is far from

clear, however, even sidestepping the question whether the representation of events indeed takes this particular format.[7]

A second issue is whether it is correct to view all triadic control verbs as variations on one theme – a transfer event – or whether this notion stretches the metaphor of "transfer" a bit too far. In what sense, exactly, are *urging*, *signaling or dissuading* "transfer events?"[8] Rooryck provides no independent criteria, except for noting that some triadic control verbs occasionally occur in double object frames.

(231) a. The policeman urged/signaled to the crowd to step back.
b. George dissuaded Diane from selling her old sofa.

Perhaps most unclear is the empirical extension of the notion "[–realized] event." Notice that Rooryck assumes a very traditional picture, in which infinitival tense is, by definition, "unrealized." However, there are serious problems with this view, as there is no independent semantic evidence that infinitival tense is *uniformly* "unrealized." In particular, factive and implicative infinitival complements are entailed, i.e., they are [+realized] (see extensive discussion in Section 4.1.1, examples (172)–(175)). Thus, for verbs like *manage*, *hate*, *regret*, *dare* etc., it is not clear that the control relation (i.e., Agr-binding for Rooryck) has any temporal relation to "ride" on.

One could perhaps shrug off this problem by noting that such verbs are typically dyadic, taking only a subject and an infinitive argument; hence there is no question of choosing the controller. This may or may not be true, depending on whether Rooryck's analysis can accommodate selection of [+realized] subevents. More problematic, however, is the fact that the entire verb class of "actual transfer" in (227) falls under the implicative or factive category (*punish* and *praise* are factive); treating their complements as [–realized] is, I believe, a misanalysis.

*Force*-type verbs differ from *ask*-type (and from *persuade*-type) verbs in two crucial respects. First, the truth of their complement is entailed (232); second, they do not tolerate a temporal mismatch between the matrix and the embedded event (233).

[7] It is instructive, in this context, to compare Rooryck 2000 with Landau 2000. The latter shares Rooryck's insight that control is intimately related to tense selection, and, also following Borer 1989, takes Agr to be a potential target of control (see Section 2.5). Different from Rooryck, however, Landau explicitly distinguishes between a *syntactic* mechanism of control (Agree), which delimits the set of possible controllers, and a *semantic* component, which selects the actual controller among them. For Landau, misassigned control relations (e.g., *Fred$_i$ persuaded Mary [PRO$_i$ to sell the car]*) are syntactically well formed but semantically anomalous; for Rooryck, they are syntactically ill formed (formally, a condition A violation).

[8] Note that *signalling* could be understood as the transfer of a signal, however, this is not the construal needed within Rooryck's analysis; instead, the transferred entity must be the event denoted by the infinitive.

(232) a. Mary forced Bill to lock the door.
⇒ Bill locked the door.
b. Mary asked Bill to lock the door.
⇏ Bill locked the door.

(233) a. * Last night, Mary forced Bill to lock the door this evening on his way out.
b. Last night, Mary asked Bill to lock the door this evening on his way out.

These two facts strongly suggest that the verbs in (227) select [+realized] and not [–realized] complements (in more standard terms, realis and not irrealis).

Finally, Rooryck's account of control shift in (229b)/(230b) is rather sketchy, so it is hard to evaluate. A detailed elaboration of the basic idea behind this account is given in Petter (1998). I refer the reader to 5.1.2 for a critical discussion of her proposal. Nonetheless, two important semantic generalizations concerning control shift come out of Rooryck's study: verbs of actual transfer (227) always feature a single controller; verbs of future transfer (228)–(230) allow variable control.

Jackendoff and Culicover (2003) (henceforth, J&C) incorporate S&P's (1991) insights into an account which identifies conceptual structure as the level where controller choice is determined. At this level, verbs are decomposed into more primitive (conceptual) predicates, and event participants are classified into different semantic types. Nonfinite VP complements (J&C remain neutral on the status of PRO) break into *actional* and *situational* types, distinguished by the pseudocleft test (e.g., *What Roberta did was read a book/*realize it was raining*). Focusing on verbs that select actional infinitives or gerunds, J&C advance the following generalization.

(234) Heads that select actional nonfinite complements assign unique control to them. The unique controller is the argument to which the head assigns the Actor role for that action.

As in S&P 1991, controller choice is indifferent to syntactic structure, hence applies uniformly across environments such as (225). However, the underlying source of (234) is not to be found in a tripartite classification of control verbs (as in S&P), but rather in their conceptual constituents. Actional complements impose unique control because they are selected by certain conceptual predicates whose core meaning involves a control relation. J&C list the following conceptual predicates: INTEND, OBLIGATED, ABLE, SHOULD, REQUEST, CAUSE (the latter ranges over force-dynamic predicates).

Each of these predicates selects an actional complement whose subject is necessarily bound by another argument of the predicate. Thus, the actor of the action complement must be the intender of INTEND, the person under obligation with OBLIGATED, the person under influence in CAUSE, the addressee

of a REQUEST, etc. By virtue of harboring these predicates in their conceptual structure, control verbs display the unique control they do. For example, *decide* and *persuade* incorporate INTEND, which assigns unique control to the intender (subject of *decide*, object of *persuade*). *Promise* and *order* incorporate OBLIGATED, which assigns unique control to the person under obligation (subject of *promise*, object of *order*). And so on.

J&C's analysis of OC raises several difficulties. The first problem is one of generality. Although advocated as a general theory of control (for English), the analysis only applies to OC verbs that select actional complements. Many OC verbs, however, allow situational complements: the large desiderative class (235a), factive predicates (235b) and propositional ones (235c) (the latter class is much bigger in Romance languages).

(235) a. John wanted/wished/hoped/was afraid to be tall.
b. John was glad/hated to be tall; John regretted/was annoyed at being tall.
c. John claimed/pretended to be tall.

In passing (p. 551), J&C suggest that OC here may be due to the experiencer role. This would leave out *claim* (and *say*, *declare* etc. in Romance languages), and also falsely predict OC into gerundive subjects of psych verbs (e.g., *I know that helping myself surprised Mary*). In truth, J&C do not offer a comprehensive explanation of OC.

A second issue is that an actional complement does not guarantee unique control, contra (234). Predicates that license split control typically select actional complements, as (236) confirms.

(236) What $\text{John}_i$ did was propose to $\text{Mary}_j$ [$\text{PRO}_{i+j}$ to help each other].

For unique control actional complements, it is not clear whether the six underlying primitive predicates represent an exhaustive list or not. Thus, the overall reduction ratio of facts (all control verbs) to theory (all conceptual predicates) remains unknown. More fundamentally, note that the core fact of OC is ultimately restated as part of the meaning of INTEND, OBLIGATED etc. Thus, we are told that "one cannot be obligated to perform someone else's actions," and because of that, OBLIGATED forces unique control. Is that truly more explanatory than saying that "one cannot be ordered to perform someone else's action?" Note that we cannot possibly have direct intuitions about underlying conceptual predicates. Tellingly, J&C's reasoning invokes our intuition about the English predicate *obligated*, not about the primitive predicate OBLIGATED. Yet *obligated* is just an OC adjective; to the extent that J&C appeal to OC in one predicate in order to explain OC in other predicates

(similarly with *intend* "explaining" *decide*, *request* "explaining" *ask* etc.), the explanation runs in a vicious circle; the very fact of OC is still presupposed.[9]

### *5.1.2 Control shift*

The phenomenon of control shift was first noted by Rosenbaum (1967: 92, fn. 13) (see also Postal 1970: fn. 31, Hust and Brame 1976). It is witnessed in constructions with two matrix arguments, normally agent and goal. Whereas in normal circumstances the controller of PRO is fixed either as the agent or the goal, in special circumstances the controller shifts to the other argument. Precisely what these "special circumstances" are is what theories of control shift attempt to identify and where they differ. Below are representative examples from Bresnan 1982, Farkas 1988 and Sag and Pollard 1991.

(237) Agent → Goal
- a. Mary$_1$ was never promised [PRO$_1$ to be allowed to leave].
- b. ? John never promised Mary$_1$ [PRO$_1$ to be allowed to leave].
- c. Grandpa promised the children$_1$ [PRO$_1$ to be able to stay up for the late show].
- d. Montana$_1$ was promised (by the doctor) [PRO$_1$ to be healthy by game time on Saturday].

(238) Goal/Theme → Agent
- a. Jim$_1$ asked Mary [PRO$_1$ to be allowed to get himself a new dog].
- b. Susie$_1$ persuaded the teacher [PRO$_1$ to be allowed to leave early].
- c. The council$_1$ petitioned the mayor [PRO$_1$ to be allowed to lower property taxes].
- d. John$_1$ begged Mary [PRO$_1$ to be allowed to consult a doctor].

Some comments about the quality of the data: the examples are cited with the judgments as given by the authors, however there is considerable variation among speakers as to the status of certain cases. It is usually noted (e.g., Bresnan 1982, Melvold 1985) that the Agent → Goal shift is more acceptable when the goal is passivized; hence the contrast (237a–237b). Comrie (1984) rejects examples parallel to (237c), claiming that the only "shifting" modal is *be allowed to*. Chomsky (1980) also notes that substituting *get permission* for *be allowed* in (237a) results in unacceptability. And examples like (238b) are marginal for some speakers (Melvold 1985, Farkas 1988).

Different verbs tolerate control shift to different degrees (in different languages): *ask* is quite flexible for many speakers, shifting between object- and subject-control even without the insertion of *be allowed to*, solely on the basis of pragmatic understanding of authority relations (Farkas 1988).

[9] For further critical commentary on J&C's decompositional account of OC, see Boeckx, Hornstein and Nunes 2010b: 230–237.

(239) a. The pupil asked the teacher to leave early.
b. The guard asked the prisoner to leave the room.

The verbs *offer* and *propose* are similarly flexible in German (240a) (Wurmbrand 2001: 238). Comrie (1984) even cites an example where pragmatic understanding, acting together with the *be allowed to* context, permits subject control with *persuade* (240b) (see also Levinson 1987). Note that such examples are impossible in many other languages, the source of the variation being unknown.

(240) a. $\text{Ich}_i$ habe $\text{ihm}_j$ angeboten [$\text{PRO}_{i/j}$ mich zu erschießen].
I have him offered me/myself to shoot
'I offered him to shoot myself'
'I offered him that he could shoot me'

b. Scipio überredete den Senat, frei handeln zu dürfen.
Scipio persuaded the senate free to.act to be.allowed
'Scipio persuaded the senate that he should be permitted to have a free hand.'

Likewise, choice of controller with *signal* is context-dependent (goal in (241a), agent in (241b), from Sag and Pollard 1991).

(241) a. The parked police car signaled (to) the oncoming motorist to turn left.
b. The speeding car signaled (to) the startled pedestrian to turn left.

Other verbs strongly resist control shift even with *be allowed to* in the embedded clause, no matter how plausible the pragmatics is (Melvold 1985, Farkas 1988).

(242) a. * $\text{Bill}_i$ forced the judge [$\text{PRO}_i$ to be allowed to live].
b. * $\text{John}_i$ authorized Mary [$\text{PRO}_i$ to be allowed to defend himself].
c. * $\text{John}_i$ encouraged Bill [$\text{PRO}_i$ to be allowed to leave].

Finally, variation is even greater once one looks at other languages. Control in Russian, German and Chinese appears to be constrained by pragmatics more than syntax. These languages disallow unshifted control of agentive passives (e.g., *The nurse persuaded the patient to be examined by the doctor*), which is pragmatically "non-canonical", but allow more freely the Agent → Goal shift if supported pragmatically (Comrie 1984, Xu 1986, Panther 1997), as in the German example (243a). Hebrew is similar, allowing this shift even with embedded copular/passive predicates (243b).

(243) a. Der $\text{Wirt}_i$ versprach dem $\text{Gast}_j$ [$\text{PRO}_j$ um fünf Uhr
the innkeeper promised the guest at five o'clock
(von $\text{ihm}_i$) geweckt zu werden.
(by him) awakened to be
'The $\text{innkeeper}_i$ promised the $\text{guest}_j$ that $\text{he}_j$ would be awakened (by $\text{him}_i$) at 5 o'clock.'

b. ha-menahel hivtiax li$_i$ [PRO$_i$ lihiyot ha-/le'hitmanot
the-manager promised to.me to.be the-/to.be.appointed
la-ozer šelo].
to.the-assistant his
'The manager promised me$_i$ [PRO$_i$ to be (appointed as) his assistant].'

A comparative informant study of German and English revealed that the two languages are largely similar in their tolerance to the Agent → Goal shift, but German is considerably more liberal than English in tolerating Goal/Theme → Agent shifts (Panther and Köpcke 1993; see subsection on 'Panther and Köpcke' below).

Consider also the following pair from Turkish, where *threaten* shifts from agent to goal control, depending on the pragmatics of the embedded event (Słodowicz 2007).

(244) a. *pro*$_i$ sen-i [PRO$_i$ iş-in-i el-in-den
you.ACC work.2SG.P-ACC hand-2SG.P-ABL
al-mak]-la tehdit edi-yor.
take-INF-COM threat LV-PROG-3SG
'She/he threatens you that she will take away your job.'

b. *pro* sen-i$_j$ [PRO$_j$ ev-de kal-mak]-la tehdit edi-yor.
you.ACC house.LOC stay-INF-COM threat LV-PROG-3SG
'She/he threatens you that you will stay at home.'

The source of this crosslinguistic variation in control shift is an unexplored terrain. One possibility is that the verbs being compared across languages in fact cover slightly different semantic fields (in ways which bear on controller choice). Another possibility could be that the verbs are pure synonyms, but the languages differ in the inventory and the applicability of coercion rules that they employ in order to obtain non-canonical control.

Summarizing these observations, the possibility of control shift depends on (i) the semantics of the matrix verb; (ii) the semantics of the embedded event (e.g., some modal force); (iii) pragmatic information (e.g., authority relations); (iv) language- and dialect-particular factors.

Control shift is particularly interesting from the point of view of theories that aim to pinpoint the semantic determinants of controller choice. Faced with examples where a "marked" controller is picked over the unmarked one, these theories must make clear whether this situation attests to the normal procedure of controller choice or whether it calls for some special mechanisms. In what follows we provide a critical survey of a number of attempts to address this challenge.

*Bresnan 1982.* Bresnan (1982) takes cases like (237a), repeated as (245a), to instantiate anaphoric control (NOC), rather than functional control (OC). Thus,

standard OC and control shift fall under different principles in this analysis. Bresnan claims that the distinction is consistent with the fact that (245a) can undergo extraposition and passivization (245b–245c), just like finite clauses, as opposed to functionally controlled infinitives (246).

(245) a. Mary was never promised to be allowed to leave.
b. It was never promised to Mary to be allowed to leave.
c. To be allowed to leave was never promised to Mary.

(246) a. John promised Mary to be on time.
b. * It was promised to Mary to be on time.
c. * To be on time was promised to Mary.

However, notice that (246a) cannot be passivized regardless of extraposition (an instance of Visser's Generalization; see Section 5.4.1).

(247) * Mary was promised to be on time.

This fact alone is likely to explain the ungrammaticality of (246b–246c) (given standard assumptions about connectivity), rendering Bresnan's argument circular: to account for the contrast between (245a) and (247), Bresnan points to the contrast between (245b–245c) and (246b–246c). But the latter is not an *independent* fact – rather it reflects the very same fact that calls for explanation, namely the impossibility of shifting control to the matrix goal in (247).

To substantiate the alleged analogy between the infinitives in (246) and finite clauses, Bresnan claims that *promise* takes on the meaning of *promise that*, rather than *promise to*, when followed by *to be allowed to VP* complements. Whereas the complement of *promise to* is interpreted as an action, that of *promise that* is interpreted as a theme, abstractly transferable to the matrix goal.[10]

Notice first that outside English, control shift with *promise* need not imply transfer of permission (or possession of that permission). In (243a–243b), there is no sense in which what is being promised is permission to be awakened or to become an assistant.

Second, the analogy between *to be allowed to VP* complements and finite complements is semantically dubious; the latter allow a purely epistemic usage, which involves no transfer, as in *John promised that it will rain tomorrow*. Under

[10] Larson's (1991) treatment of control shift with *promise* essentially builds on the same idea. In Farrell 1993, the "transfer of permission" qua "transfer of possession" sense of *be allowed to* complements is said to induce an affected object interpretation for the matrix goal, accounting for it becoming the controller (see fn. 6 in this chapter). This seems to predict that (ii) would be better than (i), contrary to fact.

i. * What I did to *those guys* was promise *them* to finish the job.
ii. * What I did to *those guys* was promise *them* to be allowed to finish the job.

this reading, the matrix subject need not be animate. Sag and Pollard (1991) cite an elegant minimal pair, showing this very clearly.

(248) a. The fortune cookie promised Montana that he would play in the Super-Bowl.
b. # The fortune cookie promised Montana to be allowed to play in the Super-Bowl.
[cf. The coach promised . . . ]

This observation is telling; if all that was going on in (248b) was a control relation between the matrix goal and PRO, it would be mysterious why the animacy of the matrix *subject* should intervene in such a relation. However, if the matrix subject is still implicated in the ultimate interpretation of these constructions (as an indirect party, responsible for the actualization of the embedded event), then this fact is expected. It therefore seems that Bresnan's analysis fails to provide an adequate account of control shift.

*Farkas 1988.* To explain control shift, Farkas posits a markedness principle, which selects as controller not the initiator (see Section 5.1.1) but an individual x whose actions are determined by the initiator i, a relation she terms A(i,x). This has the effect of shifting from subject to object control (or vice versa) in certain cases. The unmarked principle of controller choice selects i as a controller if RESP(i,s); the marked principle of controller choice selects x if A(i,x) and RESP(i,s). The marked principle applies selectively to different verbs in different dialects. The system produces the following range of variation.

(249) In a control construction with a matrix argument i and an infinitival s, s.t. RESP(i,s):
a. Unmarked: Assign controller to i.
b. Marked: Assign controller to an argument x, s.t. A(i,x).
option (1): always.
option (2): never.
option (3): only if i is not projected as a "core" argument.
option (4): only if (a) leads to a responsibility clash.

(249a) derives the standard control cases. Consider now how (249b) derives the following paradigm (with dialectal judgments as reported by Farkas).

(250) a. The pupil$_i$ asked the teacher$_j$ [PRO$_{i/j}$ to leave early].
b. * John encouraged Bill$_i$ [PRO$_i$ to be allowed to leave].
c. John$_i$ was promised [PRO$_i$ to be allowed to leave].
d. # John$_i$ promised Bill [PRO$_i$ to be allowed to leave].
e. John$_i$ persuaded Bill [PRO$_i$ to be allowed to leave].

Farkas is explicit about the fact that the judgments in (250) are dialectal; rather than dismissing them, she takes on the task of explaining them.

Those speakers who accept both control possibilities in (250a) classify *ask* under option (1) of (249b). Those speakers (probably everyone) that reject (250b) classify *encourage* under option (2) of (249b). Farkas then notes that some speakers accept (250c) while rejecting (250d); for them, selecting the marked controller is contingent on the absence of the unmarked one – namely, on passive. These speakers classify *promise* under option (3) of (249b). The infelicity of (250d) results from the forced application of the unmarked procedure (249a), which yields a responsibility clash (the initiator is not an intentional causer of the embedded situation). Finally, those speakers who accept (250e) are slightly more liberal: they do allow control shift if the unmarked procedure yields a responsibility clash. These speakers classify *persuade* under option (4) of (249b).

Thus, Farkas developed an explicit markedness theory, explaining why control shift exhibits so much variability across speakers, and in the specific ways it does. Other theories cannot boast comparable empirical accuracy. Nevertheless, the theory retains one empirical gap, concerning examples like (251a).

(251) a. * $\text{John}_i$ was promised [$\text{PRO}_i$ to leave].
b. John promised Bill that he will leave.

Control in (251a) is not ruled out by either option (3) or (4) of (249b) (option (2) does not apply to *promise*): the initiator is not projected, and selecting it as a controller will not result in a responsibility clash since PRO is an agent. Farkas claims that (251a) is excluded "due to a constraint independent of control, which requires the participant linked to the DO-argument of *promise* to be disjoint in reference from the participant linked to the initiator" (p. 49). This constraint, she says, is witnessed in (251b), where *he* must be disjoint from *Bill*.

Farkas' judgment, I believe, is incorrect; *Bill* and *he* can corefer in (251b), even under the "commissive" (rather than epistemic) reading of *promise*, which is the reading in (251a). Oddly, Farkas' analysis takes the contrast between (250c) and (251a) to be entirely independent of all the other constraints on control shift.

This points to another weakness of the analysis, namely its failure to isolate the specific feature of the *be allowed to* complement, which makes it almost obligatory in contexts of control shift. Notice that for Farkas, the shift to a marked controller depends at most on PRO being assigned a non-agent role. Thus the analysis incorrectly predicts that speakers who accept (250c) will also accept (252).

(252) * John was promised to be invited to the party.

This seems incorrect; modality plays a key role in licensing control shift, a role which is left unacknowledged in Farkas' theory.

*Sag and Pollard 1991*. The key insight of S&P's analysis is that control shift involves not only a shift in the controller but also a shift in the semantics of the infinitive. S&P note that passivization in the infinitive is neither necessary nor sufficient for control shift; rather, what is common to the infinitives in (237)–(238) is that they all denote *states*. This is incompatible with the semantics of control verbs, which require their complements to denote *actions*. This conflict is resolved by what S&P term *causative coercion*: the state is coerced into an action by interpolation of a hidden causative structure. Causative coercion is said to be independently needed to account for imperatives like *Be optimistic! Be noticed!*, which are interpreted as *Make yourself optimistic! Make yourself noticed!*.

Thus, the sentences in (253) are interpreted as in (254).

(253) a. John promised Mary to be allowed to attend the reception.
b. John asked Mary to be allowed to get himself a new dog.

(254) a. John promised Mary *to cause her* to be allowed to attend the reception.
b. John asked Mary *to cause him* to be allowed to get himself a new dog.

The structures in (254) are not merely paraphrases; at the relevant level where control is established, these are the actual lexical representations. Notice that the interpolated causer is controlled by the unmarked argument (subject in (254a), object in (254b)); thus, strictly speaking, there is no such thing as control shift in S&P's system. Nevertheless, the observed shift in controller does involve a special mechanism, not operative in normal OC – namely, causative coercion.

However, S&P need to explain not only the (intuitively correct) fact that the hidden causer of the infinitive is controlled by the unmarked controller (e.g., the committor of *promise*), but also the fact that the actual subject of *be allowed* is controlled by the marked controller (e.g., the commissee of *promise*). It is here that the assumption that the unexpressed subject of the infinitive ('PRO') is a reflexive comes into play. Condition A requires a local antecedent (where the matrix clause counts as the local domain as in Manzini 1983). Thus the subject of *be allowed* in (254) must be coindexed with either the matrix object or subject.[11]

An important insight of S&P's analysis is the link between control shift and an overall semantic shift in the event structure of the infinitive. This link, implicit in earlier proposals, is made explicit and in fact drives control shift in the first place: it is because states are "uncontrollable" that causative coercion steps in and control is shifted. This captures the fact that even when a marked controller is chosen, the unmarked one is not inert, as shown in (248) above.

[11] S&P observe that control shift is not obligatory; thus (253) can mean "John promised Mary that he would be allowed to attend the meeting."

The unacceptability of (248b) follows from S&P's analysis, but not from other proposals, as far as I can see.

Nevertheless, one may question the correlation between control shift and states. It is a strong prediction of S&P theory that eventive infinitives will not trigger causative coercion and hence will block control shift. This is certainly too strong for *ask*, which for many speakers allows subject control without the insertion of *to be allowed* (cf. (239a)). More seriously, it is far from obvious that complements that trigger control shift must be stative. In the German example (243a), the infinitive denotes an event (of awakening), not a state; the same for the Hebrew example (243b), where the morphology of *le'hitmanot* 'to be appointed' is unambiguously verbal. In (255), the passive *be granted* must be verbal and not adjectival – hence not stative – as it takes a bare nominal complement.

(255) John was promised to be granted permission to leave.

Notice that stativity of the infinitive is not a sufficient condition for control shift even under S&P's analysis; thus, predicates like *resemble* and *be tall* can never occur in controlled infinitives. Likewise, the stative infinitive in (247) does not trigger control shift. As Farrell (1993) observes, predicates that license causative coercion under imperatives (e.g., *be happy*, *be optimistic*) do not license control shift under *promise*, an unexplained gap for S&P.

(256) $I_i$ promised the $kids_j$ [$PRO_{i/*j}$ to be happy/optimistic].

The above considerations suggest that stativity is neither necessary nor sufficient for control shift. While the notion of causative coercion does capture an important aspect of the way control shift is interpreted, it seems that S&P misidentified its trigger.[12]

*Panther and Köpcke 1993*. P&K's account of control shift is couched in a prototype view of semantic-pragmatic roles. Three roles are recognized: AG, BEN and DEP. AG is the prospective performer of the action denoted by the complement clause; it is also the prototypical controller. BEN is the prospective beneficiary of the action; it is the non-prototypical (shifted) controller. A third role, DEP, describes a participant who depends in some way on another participant; it is involved in environments where control shift fails.

[12] A variant of the coercion account is presented in Jackendoff and Culicover 2003. However, J&C attribute the *be allowed to* shift not to an interpolated causative clause but to an "ENABLE" clause, whose beneficiary role is bound to the marked controller. Thus, in virtue of being beneficiaries of the promised or requested action, the addressee of *promise* and the agent of *ask* may become controllers. This is essentially Melvold's (1985) analysis of control shift, which is stated in terms of thematic binding. The role of "Beneficiary" in control shift was highlighted in the cognitive-oriented analysis of Panther and Köpcke 1993; see the next subsection.

As P&K stress, these semantic-pragmatic roles are fundamentally different from familiar θ-roles (which is why I label them with capital letters), abbreviating "pragmatic inference chains based on default assumptions about the world." Thus, the AG of *promise* is its subject, but the AG of *request* is its object – since both denote the prospective performer of the embedded action. Likewise, the BEN of *promise* is the object, but the BEN of *request* is the subject. The latter also bears the DEP role, being dependent on the requested party. In contrast, promises and recommendations do not involve a DEP role. The distribution of roles among the subject and object arguments of several common control verbs in German and English is illustrated below.

(257)

| Verb | Subject | Object |
|---|---|---|
| *promise* / *versprechen* | AG | BEN |
| *request* / *bitten* | BEN, DEP | AG |
| *persuade* / *überreden* | BEN | AG |
| *force* / *zwingen* | BEN | AG, DEP |
| *recommend* / *empfehlen* | – | AG, BEN |

The main operative principle of controller choice is (258a), whose application is governed by the rules in (258b).

(258) a. *The principle of role identity*
The semantic-pragmatic roles of the controller and PRO are (nearly) identical.

b. Prototypical control: the matching role is AG.
Precondition for control shift: decreasing agentivity of PRO.
Control shift: if a nonagentive PRO can be interpreted as BEN and there is a matrix BEN argument, the latter is the controller.

That is, role identity first seeks to match the matrix AG with PRO, and if that fails (because PRO is not AG), it opts for matching the matrix BEN with PRO. If this fails too, the sentence is rejected. This system accounts for most of the data of control shift in German, as discussed below; English involves some additional machinery.

P&K tested the judgments of thirty-five German speakers and twenty-eight English speakers on various control examples. The matrix verbs belonged to the categories exemplified in (257) (labeled commissives, directives, perlocutives, implicatives and consultatives). The embedded predicates formed a sequence of decreasing agentivity: action verbs (e.g., *buy*), predicate adjectives (e.g., *be quiet*), goal-subject verbs (e.g., *receive*), *be-allowed-to* complements and passive complements (e.g., *be helped*). The results confirmed that control shift is indeed a gradient phenomenon, both across speakers and languages. They also reveal a richer empirical picture than is standardly assumed in generative studies which are not based on experimental data.

For *promise*/*versprechen*, control shift from AG to BEN (that is, Agent → Goal) was mainly found with *be-allowed-to* and passive complements. The latter type, less commonly reported, is illustrated in (259a). 71 percent of English speakers and 86 percent or German speakers accepted it. For *request*/*bitten*, the gap between the two languages was much more dramatic. Around 90 percent of the German speakers opted for subject control with goal-subject, *be-allowed-to* and passive complements; see (259b). Among English speakers, control shift was accepted by an average of 18 percent (the verb *implore* was somewhat more tolerant). For *persuade*/*überreden*, a shift to subject control was attested to a somewhat lesser degree in German (75 percent on average) and a higher degree in English (30 percent on average).

(259) a. Jürgen verspricht Harry$_i$ [PRO$_i$ befördert zu werden].
Jürgen promises Harry promoted to be
'Jürgen promises Harry to be promoted.'

b. Paul$_i$ bittet Egon [PRO$_i$ bei der Arbeit unterstützt zu werden].
Paul asks Egon with the work helped to be
'Paul asks Egon to be helped with his work.'

To explain the higher acceptability of control shift in German compared to English, P&K appeal to two additional principles. First, English employs a pragmatic rule which reinterprets PRO as an agent even in contexts where it is thematically nonagentive. For example, most English speakers assign object control to the translation of (259b), interpreting it along the lines of 'Paul$_i$ asks Egon to bring about a situation where somebody helps him$_i$.' This reinterpretation of PRO as an agent allows English speakers to retain role identity with the prototypical controller.[13]

Second, English employs a principle of iconicity, which says that "the NP which is closest to the complement clause on the syntactic level is also most likely to be coreferential with the controlled element in the subordinate clause" (p. 101). This is of course highly reminiscent of the MDP (see Section 5.1.3), framed probabalistically. The principle of iconicity favors object control over subject control (across an intervening object), thus it also diminishes the rates of control shift from object to subject in English. Interestingly, P&K found that 15 percent of English speakers assign an object control reading to *promise* even when PRO is agentive, a result they attribute to iconicity as well.

The relative resistance of English to switch control from object to subject was also found with *force*/*zwingen*. Over 50 percent of German speakers switched to subject control with this verb when the embedded predicate was clearly nonagentive, but only 10 percent of English speakers did. Finally,

[13] This idea is a pragmatic rendering of the "causative coercion" semantic analysis of Sag and Pollard (1991).

*recommend/empfehlen* hardly triggered control shift in English, and showed the lowest susceptibility to shift control in German too (an average of 36 percent in *be-allowed-to* and passive complements). On the other hand, an average of 36 percent of the speakers rejected examples with these complements altogether.

(260) a. ? Klaus empfahl Uwe, vor dem Ausschuβ eine Rede halten zu dürfen.
?? 'Klaus recommended Uwe to be allowed to deliver a speech to the committee.'

The high rejection rate with this verb, according to P&K, is due to two factors. First, the matrix BEN is the same argument as the matrix AG – the object. Thus, even in the presence of a "trigger" for control shift – a nonagentive PRO – the nonprototypical controller (the subject) cannot semantically match a BEN PRO (unlike the situation with *request/bitten*). Second, the absence of a DEP role with *recommend/empfehlen* makes it "pragmatically incompatible" with *be-allowed-to* complements, where PRO clearly bears a DEP role.

P&K's analysis has several advantages. First, it is based on a database which is broader and more fine-grained than most other studies of control shift. Their findings make it clear that control shift is a gradient phenomenon – hence should be handled outside syntax. Second, they have identified a key semantic relation that is involved in many occurrences of control shift – the beneficiary role. In their words: "The probability of control switch is reinforced if PRO is interpreted as a Beneficiary and if it can be linked to an argument in the matrix clause, which in turn is also identifiable as Beneficiary" (p. 78).

On the other hand, P&K's account raises some issues. First, it is not clear whether and how it should extend to the verbs *propose/offer* and *signal* where the shift from object to subject control is not contingent on the (non)agentivity of PRO; cf. (240a), (241). Furthermore, the BEN role of *offer/propose* seems to reside solely with the matrix object, and *be-allowed-to* complements are quite marginal (?? *I offered/signaled to Jane to be allowed to swim there*).

A deeper, conceptual problem has to do with the primitive status of AG – the so-called "prospective performer of the embedded action." Notice that this concept delivers the canonical controller in one unanalyzed step. As opposed to the thematic Agent (from which P&K explicitly distinguish it), AG has no testable semantic entailments associated with it – *other* than its being the controller. Thus, AG does not offer a theory of controller choice, but rather reifies our intuitions about it. Correspondingly, the theory of control shift that relies on the failure to match AG with an agentive PRO presupposes what needs to be explained – *how* the matrix argument bearing AG is identified in the first place.

*Petter 1998*. The basic observation of Petter (1998) is that the link between control shift and modality is not accidental. So, even infinitives without *to be allowed* are interpreted with a hidden modal structure, involving permission from a "Deontic Authority" (DA); the examples in (261) are analogous to (262).

(261) a. Grandma promised the children$_i$ [PRO$_i$ to stay up late].
b. The pupil$_i$ asked the teacher [PRO$_i$ to leave early].

(262) a. Grandma promised the children$_i$ *her permission* [PRO$_i$ to stay up late].
b. The pupil$_i$ asked the teacher *for his permission* [PRO$_i$ to leave early].

In English, the DA argument can be made explicit in a periphrastic *by*-phrase of a passive *allow* – that is, the allower is the DA argument. Dutch is more flexible, expressing DA as the object of the preposition *van* "from" in a variety of contexts.

(263) Jan mag / moet weggaan van Marie.
John may / must leave from Mary
'John may leave, because Mary allowed him to.'
'John must leave, because Mary forced him to.'

As Dutch modals are regular verbs, they can appear in infinitives, producing the same effect of control shift that *be-allowed-to* complements produce in English.

(264) a. John$_i$ had Mary$_j$ beloofd [PRO$_{?i/j}$ laat op te mogen blijven].
John had Mary promised late up to may.INF stay
'John promised Mary that she may stay up late.'
b. John$_i$ vroeg Mary$_j$ [om PRO$_{i/*j}$ vroeg weg te mogen gaan].
John asked Mary for early away to may.INF go
'John asked Mary if he may leave early.'

Petter argues that when the DA argument is left implicit, as in the above examples, it behaves like a pronoun. If this pronoun is coreferent with the unmarked controller, PRO must shift to the marked controller to avoid a condition B violation. Thus, on Petter's account, control shift is a disjoint reference effect. The controller shifts to another matrix argument, which yields a semantically coherent interpretation.

(265) John$_i$ promised Mary$_j$ [PRO$_{*i/j}$ to be allowed by him$_i$/e$_i$ to leave early].

It seems that the semantic intuition behind Petter's proposal is correct; modality, explicit or implicit, is a constant feature of control shift constructions. However, Petter's analysis suffers from several problems. First, it is not clear that the type of modality involved must be *deontic*; consider example (237d), repeated below, from Sag and Pollard 1991.

(266) Montana$_1$ was promised (by the doctor) to be healthy by game time on Saturday.

Here what is being promised is not permission but simply a certain state of affairs; moreover, it is not at all clear that there is a hidden modal source in the infinitive (bound by *the doctor*?), so the condition B account may not extend to this case.

However, cases like (266) are pretty rare, and we may grant that by and large control shift implicates a DA argument in the infinitive. What is absent from Petter's account is an explanation of why is it just this kind of argument, as opposed to other pronominal arguments, that triggers control shift. Condition B, by itself, does not care about the semantic role of the pronominal DA argument; the shifting effect is caused by virtue of its being *pronominal*, not by virtue of its being a DA. Thus, other things being equal, Petter incorrectly predicts the following examples to trigger control shift.

(267) a. * John$_i$ promised Mary$_j$ [PRO$_j$ to visit him$_i$].
b. * Mary$_i$ was promised (by John$_j$) [PRO$_i$ to be visited (by him$_j$)].
c. * John$_i$ promised Mary$_j$ [PRO$_j$ to buy a new computer (for him$_i$)].

In all these cases, an embedded pronominal argument, overt or implicit, corefers with the matrix agent. This yields a condition B violation under the unmarked choice of controller. Still, control shift is not allowed to "save" these constructions, as opposed to (265). Thus, coreference between the unmarked controller and the embedded DA argument is not a sufficient condition for control shift. Nor is it necessary, as the following example from Melvold (1985) illustrates.

(268) ? Jane$_1$ was promised [PRO$_1$ to be allowed by Fred to go fishing].

The implicit matrix agent, which is the unmarked controller, cannot corefer with *Fred* (due to condition C). Melvold (1985) notes that this example "is acceptable only when the implicit agent of the upstairs clause is interpreted as having control over the lower clause lexical agent" (p. 16). For Petter, the downstairs agent *is* the DA argument; in fact, she goes to great lengths to establish that the DA function is superimposed on the "allower" argument (the thematic *source*, in her terms). Therefore, the possibility of control shift in (268), where condition B is not at stake, remains unexplained.

While Petter's core intuition that control shift relies on a hidden DA argument is probably correct, that argument cannot be part of the lexical entry of the embedded predicate, and must be represented at a more abstract level. Moreover, the shift in control cannot be mediated by condition B, which is both too strong and too weak.

### *5.1.3 The Minimal Distance Principle*

The family of theories discussed in Sections 5.1.1–5.1.2 all share one fundamental insight: while syntax may have a role in delimiting the OC domain – that is, the domain in which a controller must be found – the choice between subject and object control *within* that domain is not syntactic, but rather sensitive to complex semantic/pragmatic factors. This basic insight is denied by a school of thought originating in Rosenbaum (1967), according to which a locality principle, the Minimal Distance Principle (MDP), determines the controller.

The MDP tradition has a semantic strand and a syntactic strand. The semantic one is represented in the categorial grammar literature by Thomason 1974, 1976, Bach 1979 and Bach and Partee 1980. The syntactic strand, following Rosenbaum (1967), is represented by Larson 1991, Martin 1996, Manzini and Roussou 2000, and has been revived within the A-movement approach to OC (see Section 2.4), in Hornstein 1999, 2003 and subsequent work. We have already discussed the details of the semantic tradition in Section 2.1, and pointed out its problems. In this section I focus on the syntactic tradition.

Challenges to the MDP were noted as soon as it was proposed (see (9)–(10) in Section 1.1, from Chomsky 1968 and Postal 1970). The most famous challenge (though not the single one, as we will see below) is the verb *promise*, which exhibits subject control across an object. Larson 1991 is the most serious attempt to defend the MDP in the face of this counterexample. Therefore, I will mostly follow his discussion below.

Larson's version of the MDP is as follows.

(269) *Minimal Distance Principle*
An infinitive complement of a predicate P selects as its controller the minimal c-commanding noun phrase in the functional complex of P.

While subject control in *promise* was treated as a lexical exception by Rosenbaum (1967), the main goal of Larson (1991) is to show that *promise* is well-behaved with respect to the MDP, given certain assumptions. Specifically, Larson derives subject control across an object from two assumptions: (i) *promise* is a double-object verb: underlyingly, the infinitive (theme) is higher than the object (goal); (ii) the MDP applies to D-structure. Therefore, the agent is the closest NP c-commanding the infinitive at D-structure, and subject control is predicted by the MDP.[14]

[14] A more radical solution is offered in Oh 1988, where the goal of *promise* is taken to be an adjunct, invisible to the procedure that selects the controller (in Oh's analysis, the Obliqueness Hierarchy of HPSG). Essentially the same idea underlies Bowers' (1981: 187) proposal that control is computed over the basic intransitive *promise*, and only later the object (goal) is inserted by a rule of transitivization. See also Ussery 2008, where the goal is an applicative argument that is late-merged – crucially, after control has been established. It should be noted that there is little independent evidence for the goal argument being so different from standard (indirect) objects.

(270) a. John promised Mary to leave.
b. VP D-structure: [$_{VP}$ John e$_{V}$ [$_{VP}$ [$_{V'}$ [$_{V'}$ promised Mary] [$_{IP}$ PRO to leave]]]]

Let us put aside reservations about (i) and (ii), although they are quite serious (is the double object construction derived by "goal" movement across the theme? Does D-structure exist?), and examine the predictions of this account. Larson discusses two predictions that are, prima facie, false: first, object control with double-object verbs should be strictly impossible, and second, subject control with non-double-object verbs should be equally impossible.

The first prediction is challenged by control shift with *promise* taking *be-allowed-to* complements, and by *ask*, *teach* and *allow*. As to control shift, Larson expels it from the theory of control, treating sentences like (237a, 237b)/(238a) above as NOC, where the "control" construal comes about from a chain of entailments associated with transfer of possession (as in Bresnan 1982). Concerning *ask* and *teach*, Larson argues (on the basis of various semantic facts) that their usage with infinitives is not derived via dative shift, hence they are not expected to display subject control.

As to *allow*, Larson denies that it is a control structure; rather, following Mittwoch 1976 he takes it to be an ECM verb, which takes an implicit dative argument. When that argument is coindexed with the ECM subject, we get the "deontic" reading (allowing a person); when that argument is *pro*$_{arb}$, we get the "epistemic" reading (allowing a situation). Thus, (271a) is re-analyzed as (271b) (see Barrie and Pittman 2010 for a further application of this analysis to "mandative" verbs).

(271) a. John allowed Mary$_i$ [PRO$_i$ to sing].
b. John allowed [Mary to sing] (to Mary/*pro*$_{arb}$).

It is uncontroversial that *allow* does appear in Raising-to-Object structures (e.g., *The government will never allow there to be a demonstration*). The question is whether Larson is correct is claiming that it *never* appears in control structures. (271b) raises several difficulties. First, why must the matrix dative argument remain implicit? Larson does not discuss this basic point. Second, when it is specific, why must the implicit dative be coindexed with the ECM subject? Notice that implicit datives, in general, can pick up discourse antecedents (272a). However, (272b) cannot have the interpretation (272c), where the implicit dative is coindexed with a discourse antecedent distinct from the ECM subject.

(272) a. Sue$_i$ was shocked. John said (to her$_i$) to behave herself.
b. Sue was shocked. John allowed Mary to sing.
c. * Sue$_i$ was shocked. John allowed [Mary$_j$ to sing] (to her$_i$).

This seems to suggest that a real control relation is established between the "allowee" and the subject of the infinitive, contra to Larson's analysis.

Finally, consider sentences like (273a).

(273) a. Mary was allowed to sing.
b. $\text{Mary}_i$ was allowed [$t_i$ to sing] (to $pro_{arb}$/*Mary/*$\text{her}_i$).

Since Larson excludes a control analysis, the matrix subject in (273a) must originate as the ECM subject. But then, after raising, it c-commands the implicit argument. Larson would then predict that (273a) only has the "epistemic" reading in (273b), the "deontic" reading inducing a violation of condition B or C. This is false; (273a) is truly ambiguous, with one reading implying that *Mary* is the target of the allowing (cf. *Mary was personally allowed to sing*).

Consider the second challenge to Larson's theory: (non-shifted) subject control with non-double-object verbs. In fact, there are quite a few such cases (most of the examples below are from Jackendoff and Culicover 2003).

(274) a. $\text{John}_i$ vowed/pledged/committed/was obligated to Susan [$\text{PRO}_i$ to take care of himself].
b. $\text{John}_i$ proposed to Susan [$\text{PRO}_i$ to help her with the dishes].
c. $\text{John}_i$ agreed/contracted/bargained/arranged with Susan [$\text{PRO}_i$ to take care of himself].

Not only are none of these verbs double-object verbs, but they are a semantically coherent class; namely, verbs of commitment (Sag & Pollard 1991). The same, of course, is true of *promise*, implying that a unified, more natural explanation of all subject control is to be found in lexical semantics (see Section 5.1.1).

The MDP has been recently revived within minimalist accounts of OC, which derive it from the Minimal Link Condition (MLC) on movement. In Manzini and Roussou 2000 the "movement" relation is quite abstract (termed ATTRACT), associating a single DP (the controller) with θ-features of the matrix and the embedded predicates. The syntax of this relation is subject to a version of the MLC, which is different than Chomsky's (1995) in that "interveners" are attractors rather than attractees. In a passing remark Manzini and Roussou say that *promise* can be treated along the lines of Larson (1991). Recall, however, that it is a crucial assumption in Larson's analysis that control is established at D-structure; later on, the locality between the matrix subject and the infinitive is destroyed. But Manzini and Roussou adopt a minimalist framework, in which D-structure has no status. It is thus far from obvious how they would block the ATTRACT operation responsible for control from applying after dative shift, incorrectly yielding object control with *promise*.[15] The other problems with Larson's account carry over.

[15] If anything, the analogue of Larson's analysis, with ATTRACT-F to the matrix subject preceding dative shift, is countercyclic. Therefore, object control with *promise* is not just *allowed* by Manzini and Roussou (2000), but in fact *forced* under cyclicity. See Sportiche 2010 for a further attempt to revive a "derivational" version of the MDP, where PRO raises past the matrix object

Hornstein (1999, 2003) is aware of the exceptions to the MDP, but rather than attributing them to some hidden (double object) structure, he proposes to view the MDP as a markedness condition (e.g., acquisition data indicating the lateness of subject control; see C. Chomsky 1969). Subject control is then a highly marked option, attested in a small number of cases, as the majority of transitive control verbs exhibit unmarked object control. The problem is that the MDP is reduced, in Hornstein's system, to the MLC, and the MLC is patently *not* a markedness condition. MLC violations are sharply ungrammatical, whereas the "marked" violations of the MDP (i.e., subject control) are perfect.[16]

(275) a. * John seems it is likely $t_i$ to win.
b. John promised Mary to win.

In another attempt to reconcile *promise* with the MLC, Boeckx and Hornstein (2003) and Hornstein and Polinsky (2010b) propose that the goal argument, *Mary*, in sentences like (275b), is a concealed PP, which is headed by a null preposition. This follows a tradition of analyzing the inner object in double object constructions as the complement of a null preposition (Czepluch 1982, Kayne 1984, den Dikken 1995b). Indeed, this goal argument displays the peculiar resistance to movement that is typical of such PPs. Hornstein and his colleagues thus reason that the goal argument of *promise* is not a genuine intervener for the movement of the subject, since it does not c-command the base position (PRO, analyzed as a trace in the MTC): the PP node that dominates the goal makes it invisible to the MLC, similarly to the goal PP in raising sentences that does not intervene (e.g., *John seemed to Mary to be sad*). Hornstein and Polinsky extend this analysis to cases where control shifts from the object to the subject, arguably because the object is construed as a source, introduced by a null counterpart of *from* (e.g., *John$_i$ asked Mary PRO$_i$ to be allowed to leave*).[17]

but below the matrix subject; control shift reflects the application of the MDP before or after this movement.

[16] Moreover, the logic of inferring "markedness" from late-acquisition is problematic, and even if sustainable, could undermine the MTC itself, as adjunct control is acquired significantly later than complement control; see discussion and references in Landau 2007: 297.

[17] This suggestion seems inadequate for control shift with *persuade*; see (238b)/(240b). It also fails to extend to languages that, unlike English, have neither double object constructions nor pseudopassive. For instance, the verb *menacer* 'threaten' in French displays subject control across an object; the latter, as Sportiche (2010) shows, is clearly a *direct* object, receiving structural accusative case and undergoing passivization. Finally, Witkoś (2011) observes that control shift to the subject of *prosić* 'ask' in Polish cannot possibly be analyzed along Hornstein and Polinsky's (2010a) lines; the matrix object receives structural accusative case, which shifts to genitive under negation (otherwise impossible with oblique objects).

i. Dzieci$_i$ nie prosiły trenerki [żeby PRO$_i$ skakać z wiezy].
children.NOM not asked coach.GEN so.that to.jump from tower
'The children$_i$ didn't ask the coach [PRO$_i$ to jump from the tower].'

This analysis raises several difficulties. First, it is well known that prepositional objects *do* c-command out of their PP for all relevant purposes – condition C, variable binding or NPI licensing. The same is true of the goal argument of *promise*.

(276) a. * John promised [$_{PP}$ P her$_i$] to help Mary$_i$.
b. John promised [$_{PP}$ P every boy$_i$] to clean his$_i$ room.
c. John promised [$_{PP}$ P no speaker] to cancel any talk.

Hornstein and Polinsky suggest that the prepositional object does not c-command the complement clause at the derivational stage where the embedded subject raises to become the matrix subject, but does c-command it later on. However, they do not offer any reasons for, nor the specifics of this reconfiguration of the syntactic tree. Note also that the reconfiguration would need to alter c-command relations *countercyclically* (since the structure of the vP would be tampered with after TP had been constructed).

Perhaps more puzzling for this analysis is the apparent rarity of subject control across PPs. Once the matrix prepositional object is neutralized for intervention, there seems to be no hindrance to many more such cases. Even if a null P is associated with markedness, overt prepositions are not, so a subject control reading should be as easily accessible as an object control one. This is not the case, however.

(277) a. * John$_i$ told/taught [P Mary] [PRO$_i$ to work harder].
b. * John$_i$ recommended/appealed [to Mary] [PRO$_i$ to see a doctor].
c. * John$_i$ imposed/relied [on Mary] [PRO$_i$ to cancel the ceremony].

It seems unlikely that the absence of subject control readings in such contexts has nothing to do with the semantics of the matrix events; yet reference to semantics is precisely what the MTC declares unnecessary on the locality-based account of controller choice.

A further problem for the MTC concerns the variable effect of object drop on control. Whereas some verbs shift to subject control (278a), as predicted by minimality, others do not, retaining an implicit object control reading (278b) (see discussion of (111)–(112)).

(278) a. John asked Mary$_i$ [PRO$_i$ to leave] / John$_i$ asked [PRO$_i$ to leave]
b. John said to Mary$_i$ [PRO$_i$ to leave] / *John$_i$ said [PRO$_i$ to leave]

Discussing this problem, Landau (2007) noted that the MTC would have to claim that "object drop" with *ask* leaves no syntactic residue whereas *say* necessarily projects a *pro* object (which therefore continues to control). The problem, however, is that there is no non-circular way to predict this contrast;

in both cases, an implicit object (goal or source) is necessarily invoked in the interpretation. Moreover, if the *pro* object of *say* is introduced by a preposition just like an overt object is, subject control should proceed smoothly, as in *promise*.

A final and rather fatal problem for MDP approaches comes from languages like Korean, in which the choice of controller in OC constructions is determined by a combination of three factors – the semantic class of the control predicate, the type of the complement and the type of mood marker in the complement (Madigan 2008a, Lee 2009). The role of mood markers is quite decisive (see Section 4.1.3); in particular, combined with directive and manipulative verbs, which typically trigger object control, a volitional mood marker (*-keyss*) can impose subject control (Lee 2009: 137). Note that this effect is different from control shift, which crucially depends on manipulation of the embedded event.

(279) Ku namca$_i$-ka na$_j$-eykey ton-ul yokwuha-mye [PRO$_{i/*j}$ sacin
man-NOM I-DAT money-ACC ask-and picture
model-ul se-**keyss**-ta]-ko kangyoha-yess-ta.
model-ACC stand-VOL-DC-C force-PST-DC
'The man forced me that he would be a model of my picture, asking me for some money.'

Here, subject control across the object, in violation of the MDP, is neither marked nor idiosyncratic, but rather fully predictable from the choice of the mood marker.

In general, the facts of controller choice, and in particular control shift, present a very serious challenge to "locality" theories of control. These theories are unequipped to deal with the semantic aspects which are obviously implicated in controller choice. Neither the MDP of Larson 1991 nor the MLC of the Movement Theory of Control incorporate any reference to semantic/pragmatic factors. Moreover, it seems that the interpretive information implicated in control shift is of a rather different nature than what is made available by either θ-theory or lexical-aspect theories. Thus, there is little hope of reducing control shift to alternative hierarchical projections of arguments, in accordance with some version of UTAH (Uniformity of Theta Assignment Hypothesis) or layered AspP(s) projections. Since the latter provide the only channel of semantic input to MDP-oriented theories of OC, an adequate account of controller choice is beyond their reach.

### *Further reading*

For relevant works on the topic of Section 5.1, see Chomsky 1968, 1980, Postal 1970, Bresnan 1982, Chierchia 1984, Růžička 1983, Comrie 1984, Melvold

1985, Farkas 1988, Larson 1991, Sag and Pollard 1991, Farrell 1993, Panther and Köpcke 1993, Petter 1998, Rooryck 2000, Jackendoff and Culicover 2003.

## 5.2 Partial control

The earliest studies of control presupposed an identity relation between the controller and the controllee. This has been achieved either by deletion (Rosenbaum 1967) or by pronominalization (Postal 1970), two processes that were conditioned by identity of the terms involved. The assumption carried over for four decades,[18] but in fact, turned out to be false: OC does not require strict referential identity.

Genuine examples of partial control (PC) have been noted in a little-known squib by Wilkinson (1971). It is worth taking a look at this early attempt at coming to grips with partial control, as it contains, in a nutshell, many of the issues that still concern us today.

Wilkinson pointed out that the understood subject of the gerund in (280a) must be *I* (the matrix subject) but that of (280b) could be *we*, which properly includes the matrix subject.

(280) a. I tried drinking tepid tea.
b. I regretted killing Sam.

That the distinction is grammatically real is indicated by tests that are sensitive to the identity of the "deleted" subject (in our terms, PRO). Consider modification by "*the way X did*." This modifier normally produces an ambiguity: Sentence (281a) can be interpreted either as (281b) or as (281c).

(281) a. I killed Sam the way I did because I hated him.
b. *Manner adverbial reading*
I killed Sam in the manner I did because I hated him.
c. *Redundant sentential relative reading*
I killed Sam, and I did it because I hated him.

Notice that the manner adverbial reading allows a different subject for *did*, which implies two separate events (done in the same manner). This is impossible with the sentential relative reading, which requires identical subjects. Therefore, (282a) is unambiguous (no sentential relative reading). Since a person cannot be killed twice, (282b) is anomalous.

[18] Wilkinson 1971 and Lawler 1972 are notable exceptions. Wilkinson's pioneering work went uncredited for many years, including in Landau 2000; I take full responsibility for this oversight. Williams 1980 contains a single example of partial control (with *want*), but he classifies it under NOC. Comrie (1984) mentions two examples (with *want* and *help*) and Levinson (1987: fn. 45) also mentions an example with *want*.

(282) a. I shot Sam the way Harry did because I hated him.
b. # I killed Sam the way Harry/we did because I hated him.

Thus, because it depends on coreference with the higher subject, the (redundant) sentential relative reading is a useful test to probe the reference of that subject when it is null. Against this background, consider the following data from Wilkinson's squib (the PRO notation is mine).

(283) a. $I_i$ tried [$PRO_i$ shooting Sam the way Harry did] because I hated him.
*Unambiguous*: only manner reading
b. $I_i$ regretted [$PRO_{i+}$ killing Sam the way we did] because he was such a nice guy.
*Ambiguous*
c. # $I_i$ regretted [PRO killing Sam the way you/Ben/they did] because he was such a nice guy.

Because *try* does not allow partial control, PRO is identical to *I* in (283a). The distinct subject of *did*, *Harry*, filters out the sentential relative reading, as in (282a). Interestingly, (283b) does allow the latter reading, even though the subject of *did*, *we*, is not identical to the main subject *I*. This is possible because *regret* is a partial control verb, so PRO can be understood as *we*, an entity containing the controller *I*. Identity of PRO with the subject of *did* is ensured, and so is the sentential relative reading. Crucially, *regret* still does not allow NOC in its complement; a PRO which is disjoint in reference from *I* (like *you/Ben/they*) would have licensed (283c), contrary to fact.

The basic insights of Wilkinson – the existence of PC, the distinction between it and NOC, and between verbs that allow PC and those that do not – have been fully confirmed (in fact, rediscovered) in later work. However, some of his other suggestions have not survived. For example, in fn. 1 he writes about example (284a): "The deleted subject of *start* can be either *Harry* or N, where N names some group including Harry and the speaker . . . it makes sense to think of N as a kind of vague *we*." In fact, the speaker need not be included in a partially controlled PRO. This can be seen in (284b) (cf. the ungrammatical (284c)).

(284) a. Harry wants to start cooking the meat.
b. Harry wanted to meet without me.
c. * We met without me.

Wilkinson further analyzes control into subject gerunds (285a) as PC, citing (285b–285c) as evidence: since *Harry* is included in *we* but not in *Martha*, the manner reading is only forced in (285c). However, we have seen in Section 1.5 that subject clauses fall under NOC (see further discussion in Section 7.1). Thus, any "PC reading," as in (285b), is just a special case of

the free interpretation available to PRO in NOC configurations. The latter usually require some contextual setting. Once provided, sentences like (285c) are redeemed, as in (285d).

(285) a. [PRO$_i$ killing Bill] disturbed Harry$_i$.
b. [PRO$_{i+}$ killing Bill the way we did] disturbed Harry$_i$.
c. # [PRO$_i$ killing Bill the way Martha did] disturbed Harry$_i$.
d. Martha$_i$ choked Bill until his face turned blue and he stopped breathing. [PRO$_i$ killing him the way she did] really disturbed Harry.

Nevertheless, factoring out the NOC cases from the genuine complement PC cases, Wilkinson's study was pioneering in its way. It took about thirty years for partial control to reaffirm itself as a central research topic in the field. The turning point was Landau's (2000) study of control.

Landau (2000) observes that OC verbs divide into two classes. One class forces strict identity between the controller and PRO, labeled 'exhaustive control' (EC). The other class only requires that the controller be included in PRO, a relation labeled 'partial control' (PC). PC is forced whenever the controller is singular and the embedded predicate is collective. It is most natural in a context that makes salient some participant(s) that "fill up" the reference of PRO.

(286) *Exhaustive control*
We thought that . . .
a. * John$_i$ managed [PRO$_{i+}$ to gather at 6].
b. * The chair$_i$ began [PRO$_{i+}$ meeting without a concrete agenda].
c. * Mary$_i$ is able [PRO$_{i+}$ to apply together for the grant].
d. * It was rude of the chair$_i$ [PRO$_{i+}$ to disperse so abruptly].

(287) *Partial control*
We thought that . . .
a. The chair$_i$ preferred [PRO$_{i+}$ to gather at 6].
b. Bill$_i$ regretted [PRO$_{i+}$ meeting without a concrete agenda].
c. Mary$_i$ wondered [whether PRO$_{i+}$ to apply together for the grant].
d. It was humiliating to the chair$_i$ [PRO$_{i+}$ to disperse so abruptly].

The DP whose referent provides the remainder of PRO may precede or follow the nonfinite complement (288a–288b). Although the PC interpretation is forced by collective predicates, it does not require them; context may facilitate it too (288c).

(288) a. Mary told John$_i$ that she$_j$ is afraid of [PRO$_{i+j}$ being noticed together].
b. Harry$_i$ wanted [PRO$_{i+j}$ to kiss], but his date$_j$ had no intention to.
c. I couldn't bear staying there, but Harry enjoyed it. I$_i$ had to use all the threats I could think of, and eventually he$_j$ agreed [PRO$_{i+j}$ to leave].

Whether a control predicate falls under EC or PC is predictable from its semantic class in the following way.

(289) *EC-predicates*

a. Implicatives
*dare, manage, make sure, bother, remember, get, see fit, condescend, avoid, forget, fail, refrain, decline, neglect, force, compel*

b. Aspectual
*begin, start, continue, finish, stop, resume*

c. Modal
*have, need, may, should, is able, must*

d. Evaluative (adjectives)[19]

*rude, silly, smart, kind, (im)polite, bold, modest, cruel, cowardly, crazy*

(290) *PC-predicates*

a. Factives
*glad, sad, regret, like, dislike, hate, loathe, surprised, shocked, sorry*

b. Propositional
*believe, think, suppose, imagine, say, claim, assert, affirm, declare, deny*

c. Desideratives
*want, prefer, yearn, arrange, hope, afraid, refuse, agree, plan, aspire, offer, decide, mean, intend, resolve, strive, demand, promise, choose, eager, ready*

d. Interrogatives
*wonder, ask, find out, interrogate, inquire, contemplate, deliberate, guess, grasp, understand, know, unclear*

Aspectual verbs, as in (289b), are ambiguous between raising and control, and some modal predicates (289c) are possibly raising predicates too, though not all of them (e.g., *able*).[20] Raising predicates are not expected to exhibit PC for obvious reasons (a trace must be an identical copy of its antecedent), so the predicates in (289b–289c) should be taken in their control variants. Factive

[19] This class was not mentioned in Landau 2000, although Landau (2004) recognized that evaluative predicates select untensed complements.

[20] The ambiguity of aspectual verbs has already been noted in Perlmutter 1970. The raising variants are easy to detect with nonthematic subjects (e.g. *There began to be a commotion, Headway continued to be made in the battle against wildfires*). The control variants are related to the transitive verbs (i) and exhibit a thematic, agentive subject. They form grammatical *-er* nominals (ii), allow VP pseudoclefts (iii) and *do so* replacement (iv), allow argument drop (v) and complement displacement (vi). No raising verb exhibits these options (see Section 1.2.2).

i. She began the job / He finished the book.
ii. Sam is a beginner / finisher.
iii. What Bill did was begin to paint the fence.
iv. Warren tried to begin to work and Jerry tried to do so too.
v. A: Did you wash the dishes?
B: I just began.
vi. To clean this mess, I'll never finish.

predicates in English mostly select finite clauses or gerunds, and propositional predicates are almost entirely absent from control constructions (except for *claim* and *pretend*), occurring instead with raising/ECM and finite complements. In Romance and other Germanic languages, however, factive and propositional infinitives are common, and they display PC.

(291) *Factive and propositional PC in Italian*

a. Maria pensava che Gianni si fosse pentito di essersi
Mary thought that John SI had regretted of to.be-SI
baciarti alla festa.
kissed at.the party
'Mary thought that John had regretted to have kissed at the party.'

b. Il presidente crede di essersi riuniti inutilmente la notte
the chair believes of to.be-SI gathered in vain the night
scorsa.
last
'The chair believes to have gathered in vain last night.'

While the OC status of (290a–290c) is relatively uncontroversial, the claim that interrogative complements fall under OC is less obvious. With the exception of Chomsky and Lasnik 1977, Lebeaux 1984 and Landau 2000, 2003, studies of control have standardly assumed that interrogative complements display NOC, the chief reason being the possible occurrence of *oneself* inside the complement.

(292) a. John wondered [how PRO to talk to Mary about oneself].
b. Mary wasn't sure [when PRO to introduce oneself to John].

But this option cannot establish the presence of $PRO_{arb}$ in the complement. A genuine $PRO_{arb}$ is unrestricted by local DPs, cf. Kawasaki's (1993) example.

(293) It is dangerous for babies [$PRO_{arb}$ to smoke around them].

The PRO subject of the complements in (292), however, *must* include the matrix subject. This is evident in (294), where condition B is violated precisely because of the partial overlap in reference between PRO and the embedded object.

(294) a. * $John_i$ wondered [how $PRO_{i+}$ to talk to $him_i$ about oneself].
b. * $Mary_i$ wasn't sure [when $PRO_{i+}$ to introduce oneself to $her_i$].

These facts strongly suggest that interrogative complements are a species of PC and not NOC. (295a–295b) demonstrate the same point, and (295c–295d) show that the intended readings are readily available in finite complements.

(295) a. * $Mary_i$ didn't know [where $PRO_{i+}$ to hide $her_i$].
b. * $Sue_i$ asked [what $PRO_{i+}$ to buy $her_i$ in Rome].
c. $Mary_i$ didn't know where one should hide $her_i$.
d. $Sue_i$ asked what one should buy $her_i$ in Rome.

That long-distance control is impossible into interrogative complements was observed in Mohanan 1985 and Chomsky 1986: 127.

(296) * I thought they wondered how to feed myself.

Similarly, Landau (2000: 42) shows that PRO in these complements must be interpreted sloppily and as a bound variable in VP-ellipsis and *only*-contexts. As noted in connection with (89a–89b) in Section 1.4, the *oneself*-test is not a reliable NOC diagnostic.

Returning to the distinction between EC and PC predicates, the relevant question is what property distinguishes the predicates in (289) from those in (290). The answer, in fact, was already given in Section 4.1.2: it is semantic tense. Notice that the predicate classes in (289)–(290) are identical to those in (176)–(177).

(297) PC complements are tensed; EC complements are untensed.

The relevance of semantic tense to OC determination has already been discussed in Section 4.1.2, where it was shown that in [+Agr] (inflected) complements, semantic tense produces NOC. We now see that in [–Agr] complements, such as infinitives, semantic tense does not produce NOC, but rather introduces the possibility of PC. The sample data below establish (by illustration) that the four predicate classes in (289) select untensed complements whereas the four predicate classes in (290) select tensed complements. Note that a tensed complement may either be future-oriented (irrealis, (298e–298f) or past-oriented (realis, (298g–298h)).

(298)
a. * Yesterday, John managed to solve the problem tomorrow. *imp*.
b. * Yesterday, John began to solve the problem tomorrow. *asp*.
c. * Yesterday, John was able to solve the problem tomorrow. *mod*.
d. * Yesterday, it was smart of John to solve the problem tomorrow. *eval*.
e. Yesterday, John hoped to solve the problem tomorrow. *des*.
f. Yesterday, John wondered how to solve the problem tomorrow. *int*.
g. Today, John regretted having solved the problem last week. *fac*.
h. Today, John claimed to have solved the problem last week. *prop*.

Why is the possibility of PC tied to the presence of semantic tense in the complement? According to Landau (2000, 2004), [Agr] in C is parasitic on [+T] in C. Since PC complements are headed by $C_{[+T]}$ but EC complements by $C_{[-T]}$, only the former is also specified for [Agr], which makes it a possible goal for Agree. The C-mediated Agree relation "ignores" the feature [+semantic

plurality], or [+Mereology], that distinguishes PRO from its controller in PC (see Section 2.5).[21]

This brings us to the final characteristic of PC: PRO is semantically plural but syntactically singular. In other words, PC PRO is a group name (like *committee*, *team*, *class* etc). In most languages, these items license collective predicates and (uninflected) modifiers like *together*, but not plural morphology on predicates, floated quantifiers or reciprocal anaphors.

(299) a. I saw the committee gathering/dispersing.
b. I approve of the population acting together against the new regulations.
c. * It is impossible for the government to clear themselves / each other of any responsibility.
d. * The class each submitted a different paper.
e. * I consider the delegation (to be) idiots.

For this reason, plural morphology is not licensed in PC complements (unless, of course, the controller is plural itself).

(300) a. * John told Mary that he preferred to meet each other at 6.
b. * John told Mary that he regretted having talked about themselves.
c. * John told Mary that he didn't know which club to become members of.

It should be noted that the agreement properties of specific morphemes are not stable across languages and dialects. For example, speakers of British English accept the examples in (299c–299e), because in this dialect [+Mer] licences [+Plural]. Predictably, these speakers also accept (300). Likewise, languages in which *together* is inflected for [plural] are expected to rule out examples like *Bill agreed to work on the project together*. Although the semantic plurality of PC PRO is crosslinguistically invariant, the extent to which this feature is syntactically "active" is open to much variation (see Landau 2000: 50–52).[22]

[21] Dubinsky and Hamano (2007) suggest that the semantic split between EC and PC complements should be stated in terms of *event*-distinctness and not temporal distinctness. The Japanese data they discuss, however, may involve direct predication unmediated by PRO.

[22] There are two documented cases where PC may shift both semantic and syntactic number: inflected infinitives in Brazilian Portuguese (Modesto 2010a, b) and OC complements in Korean (Lee 2009).

Consider the first case (note the plural inflection in the complement).

i. O presidente$_i$ preferiu [PRO$_{i+}$ se reunirem às 6].
the chair preferred SELF meet.INF.3PL at.the 6
'The chair preferred to gather at 6:00.'

According to Modesto, these are genuine OC structures, which is already an anomaly of sorts, plausibly related to the defective character of agreement in the language (see Section 4.1.2). Furthermore, when the embedded verb is, unlike *reunir* 'meet', not intrinsically collective, nonfinite plural inflection is *required* in a PC context. Finally, propositional (but not desiderative) complements optionally allow nonfinite plural inflection even under EC readings (i.e., with a plural controller). These matters merit further empirical research and theoretical refinement.

The idea that PC and EC exploit different syntactic routes (Agree with C or Agree with PRO) receives striking support from case transmission patterns in Russian. Recall from Section 4.2 that PRO in Russian is assigned a local, independent dative case. In contexts of simple subject control, where neither a matrix object nor a lexical complementizer intervenes, the nominative case of the controller is transmitted to PRO, blocking the dative. Example (201b) is repeated below.

(301) Ona she.**NOM** sobiralas' planned [PRO PRO.**NOM** putešestvovat' to.travel odna/*odnoj alone.**NOM**/*.**DAT** v in Japonii. Japan
'She planned to travel alone in Japan.'

Landau (2008) proposes that the independent dative case is assigned by the infinitival complementizer. When C is null, however, it cliticizes to the matrix light v, becoming "invisible" to Agree with the probe (the matrix T), as it is non-distinct in features from its host v. This leaves direct Agree between the matrix T and PRO as the only control option, and case transmission inevitably ensues (finite T being specified for nominative case). If, however, C bears the [Mer] feature (semantic plurality), it is sufficiently distinct to become visible. Control proceeds via C and its dative case is assigned to PRO.

This predicts the following correlation.

(302) *Partial control and independent case in Russian*
a. partial control ⇒ C-control
b. C-control ⇒ independent DAT
c. ∴ partial control ⇒ independent DAT
(i.e., PRO under partial control must be dative)

Indeed, as Landau shows, in contrast to exhaustive control, which forces nominative transmission, partial control forces an independent dative case. The case-bearing element in the examples below is the floating quantifier '*ves*' 'all,' which displays obligatory concord with its associated NP.

(303) a. My we.**NOM** predpočli preferred [PRO PRO.**NOM** sobrat'sja to.gather vse/??vsem all.**NOM**/??.**DAT** v at šest']. six
'We preferred to all gather at six.'

In Korean, the distributor *-tul* may show up on several items, including adverbs and PPs – only in the presence of a syntactically plural subject (bearing *-tul*); semantic plurality alone does not license it. The fact that it is allowed in the complement of (ii) indicates that PRO is syntactically plural (Madigan 2008a: 124; see also Lee 2009: 173). Once again, whether or not this is a genuine counterexample depends on the specific analysis of *-tul* and of the relevant complements in Korean.

ii. Jwuhi$_i$-ka Jwuhi-NOM [PRO$_{i+}$ tosekwan-eyse-tul library-LOC-DIST moi-keyss-ta-ko] gather-VOL-DC-C yaksok-ha-yess-ta. promise-do-PST-DC
'Jwuhi promised to gather in the library.'

b. Predsedatel' predpočel [PRO sobrat'sja vsem/*vse v šest'].
Chair.NOM preferred PRO.DAT to.gather all.DAT/*NOM at six
'The chair preferred to all gather at six.'

(303a) illustrates control by a plural subject. Even though the embedded predicate is collective, the dominant reading is exhaustive control ('We$_i$ preferred that we$_i$ would all gather at 6'). In (303b) a singular subject partially controls PRO. The sharp contrast in case – transmitted nominative in EC, independent dative in PC – corroborates the hypothesis that the two types of control are *syntactically* distinct.

PC poses a challenge for most theories of control. Predicational and binding theories fail to account for PC since predicates and anaphors (which are not inclusive) may not take a partial antecedent.[23]

(304) a. The team/*manager arrived together.
b. The players/*manager discussed themselves.

Within the MTC it has been proposed (i) that PC arises from "selection of embedded comitatives" (Hornstein 2003, Boeckx, Hornstein and Nunes 2010b: 185), such that *meet* is understood as *meet with x*; (ii) that certain predicates (like *want*) are associated with a "meaning postulate" which allows overlapping reference in PC (Hornstein 2003); (iii) that PC is a lexically restricted property of *meet* and a handful of other verbs, which also shows up in raising (Boeckx and Hornstein 2004). Landau (2007) counters all these suggestions straightforwardly. First, PC cannot be reduced to implicit comitatives (a suggestion also made outside the MTC, in Słodowicz 2008), given examples like (305).

(305) a. The chair voted/decided to disperse until next week.
b. * The chair dispersed with the rest of us.

Nor is it explained why implicit comitatives are excluded from finite clauses (**She said that Harry met at 6 PM*).

The "meaning postulate" suggestion leaves unexplained the principled character of PC (Why only tensed complements? Why not raising complements? Why only semantic plurality?).[24] Finally, contra suggestion (iii), PC contexts are quite wide and productive, as illustrated in (287)–(288).

Bowers (2008), who also propounds a version of the MTC, dismisses PC as a grammatical phenomenon. He reports no significant difference in the tolerance

[23] This leaves open the possibility that PRO is an inclusive anaphor (cf. the Japanese *jibun-tachi*, Kawasaki 1989). Also worth noting are the similarities between PC PRO and the German impersonal inclusive pronoun *man* (Kratzer 1997).

[24] In Asudeh's (2005) Glue Semantics treatment of control, PC predicates are associated with a "meaning constructor" that permits either the EC or the PC reading. On this view, as in Hornstein's "meaning postulate," the systematic correlation with tense is accidental.

of PC verbs, on the one hand, and raising and EC verbs, on the other hand, to collective predicates in the infinitive. He goes further to cite examples where such predicates are allowed in matrix contexts with a singular subject.

(306) *Alleged PC with EC verbs*
a. The rank and file were eager to gather during the strike, but the organizer didn't dare to.
b. I prefer to meet on Tuesdays, but for some reason the chair isn't able to.

*Alleged PC with raising verbs*
c. The chair seems to meet whenever he feels like it.
d. After considering a number of alternatives, John appears to be convening at the regular time after all.

*Alleged PC in simple clauses*
e. This is ridiculous! The chair is meeting every day now.
f. It's weird – the minister gathers on Monday instead on Sunday!

Bowers proposes that the PC effect results from metonymy – usage of a singular noun to refer to a group which the noun represents (by being part of it). This usage is based on extra-linguistic factors, hence does not pick any linguistically significant category. The proposal essentially revives the ideas of Lawler (1972), who also appealed to metonymy to explain the PC effect.

A number of considerations, however, demonstrate that this proposal cannot do justice to the data. First, Bowers seems to accept that simple examples like (307) are ungrammatical.

(307) a. * John met at 6:00.
b. * One time, the chair gathered during the strike.

The metonymy explanation has no way to distinguish (306) – especially (e, f) – from (307).

Examining more closely the examples in (306) (and also Boeckx and Hornstein's (2004) ex. 42), we see that they all share two properties: (i) the collective predicates are *meet/gather/convene*; (ii) the sentences are generic or habitual.[25] This coincidence suggests a confound. Indeed, it is well known that generic contexts quite freely allow object drop. Notice, now, that each of the collective verbs has another variant, which is transitive, or at least dyadic (e.g., *John met/gathered/convened (with) the rest of us*). Crucially, the transitive version does not select a plural subject, hence cannot diagnose a PC context as defined above. What Bowers' examples reveal, I submit, is the general process

[25] Except for (306a). Curiously, ellipsis seems necessary to redeem this example, suggesting a hidden confound.

i. * The rank and file were eager to gather during the strike, but the organizer didn't dare to gather then.

of generic object drop.[26] Thus, a sentence like (306e) is semantically represented in (308a), and is no different from (308b), where other transitive verbs "detransitivize" thanks to genericity/habituality.

(308) a. ∀Z day(Z) ∃X [the chair meets X on Z].
b. This is ridiculous! John is photographing/cooking/cleaning every day now.

By comparison, none of the examples in (287)–(288) depends on a generic reading, suggesting that the PC effect is distinct from the detransitivization process at work in (306).

One way to resolve the confound in (306) is to focus on non-generic contexts, as in (307). Another way is to consider collective predicates that do not have a transitive variant. Bowers' prediction is that metonymy should apply uniformly to license these predicates with singular subjects, regardless of context. Landau's prediction is that only genuine PC contexts should do so, and genericity alone would not suffice. The facts favor the latter prediction.[27]

(309) a. * John knows that Mary is rarely sleeping together.
b. John knows that Mary is rarely eager to sleep together.

(310) a. * We are lucky that John always seems to work as a team.
b. We are lucky that John always prefers to work as a team.

Furthermore, if the subject of the collective predicates in (306) is truly interpreted as a (metonymically derived) plurality, as Bowers maintains, this plurality should be linguistically accessible to processes other than collective predication. That a PC PRO fulfills this expectation was already observed in (283a–283b), from Wilkinson (1971), repeated below.

(311) a. $I_i$ tried [$PRO_i$ shooting Sam the way Harry did] because I hated him.
*Unambiguous*: only manner reading
b. $I_i$ regretted [$PRO_{i+}$ killing Sam the way we did] because he was such a nice guy.
*Ambiguous*: manner or sentential relative reading.

The sentential relative reading, to recall, is contingent on coreference between X in "the way X did" and the higher subject. Since *try* is an EC verb and *regret* is a PC verb, when X is plural (like *we*) and the controller is singular (like *I*) this reading is only possible under the PC verb. In this light, consider the following contrast.

[26] Note that the omitted object itself is interpreted existentially, within a larger generic context.
[27] (309b)/(310b) cannot involve split control, an OC dependency that requires two *local* controllers; see (326) below and Fujii 2010.

(312) a. The chair seems to gather the way we do because of the urgent matters that need to be decided.
b. The chair hates to gather the way we do because of the urgent matters that need to be decided.

If (312a) is possible at all, it is only on the manner reading; i.e., the group associated with the chair gathers in the manner that we gather. (312b), however, is ambiguous between a parallel manner reading, and the sentential relative reading, which is: we, including the chair, gather, and the chair hates it. This contrast is expected if the subject of *to gather* is singular (a copy of *the chair*) in the raising case (312a) but semantically plural in the PC case (312b). It is totally mysterious if both subjects are pluralities, metonymically invoked by *the chair*.

Another proposal, within the A-movement camp, is that PC is a consequence of a repair strategy at LF (Barrie and Pittman 2004, B&P). In contrast to Hornstein's analysis, B&P maintain the traditional θ-criterion, which disallows multiple θ-roles in a chain. The A-movement in OC creates precisely this situation, hence a special mechanism of "chain splitting" is called upon at LF. The chain of the controller and its copy is split into two separate chains; as a consequence, the lower copy may acquire additional semantic features, like [+semantic plurality], producing PC. Importantly, this possibility is available to *all* OC constructions. Thus, B&P must reanalyze EC complements as restructuring, bare VP complements, without a control chain, "the controller" being base-generated as a matrix argument.

The first problem with this proposal is the absence of restructuring properties in many languages (e.g., English), certainly in languages exhibiting finite control (see Section 4.1). Furthermore, even in restructuring languages like German, the category "restructuring" does not exhaust the category "EC." In particular, weak implicative verbs (e.g., *avoid*, *decline*, *neglect*, *force* etc.) resist restructuring and yet impose EC. Wurmbrand (2002, 2003) shows clearly that even restructuring verbs may take non-restructuring complements (i.e., minimally TPs) with a structural PRO subject. Crucially, PC is never allowed there (see Landau 2000: 77–79 for pertinent discussion). Thus, contrary to B&P's description, the mere presence of two θ-positions in the control chain does not license PC.

One can raise further doubts about the special chain splitting mechanism and its outcomes. In particular, even if such a mechanism exists, it is not clear why it is a prerequisite for the "late insertion" of [semantic plurality]. As far as LF is concerned, the lower copy is now an independent chain. If [semantic plurality] can be externally assigned to such a chain in the complement of OC verbs, why can it not be assigned freely elsewhere (e.g., **John met at 6*)? Furthermore, why is the modified copy necessarily the low one and not the high one (**The committee*$_{i\,[+SP]}$ *decided* [$e_{i\,[-SP]}$ *to wear a T-shirt*])?

Another attempt to reconcile the MTC with partial control is presented in Rodrigues 2007. In her analysis, PC emerges when a null pronoun adjoins to the embedded DP: [$_{DP}$ *pro* DP]. The internal DP segment then raises to become the controller (as is standard in the MTC), stranding *pro* in the base thematic position (the embedded [Spec,VP]). Rodrigues likens this null pronoun to associative morphemes, found in languages like Japanese and Chinese; when attached to a name, say *John*, these morphemes yield a plural denotation, meaning "John and the others."

(313) [$_{TP}$ John$_i$ T [$_{VP}$ t$_i$ wants [$_{TP}$ t$_i$ to [$_{VP}$ [$_{DP}$ *pro* t$_i$] meet]]]]

Since it is only (a copy of) the singular DP which occupies the embedded [Spec,TP], Rodrigues explains the fact that the syntactic features of the controller are retained in PC complements. In particular, syntactic plurality is not licensed under a singular controller (see (300)).[28]

The first question this account raises is how the attested link between PC and embedded semantic tense is treated. Rodrigues, in fact, takes the bull by the horns and denies that such a link exists. She cites (314a), where PC appears to be possible under a modal, even though modals take untensed complements. It is not tense that matters, Rodrigues claims, but rather *modality*; when an EC verb like *try* occurs under a modal, it also licenses PC (314b). She states: "Arguably the linguistic requirement on partial control is that the null associative plural pronoun must occur within the scope of a modal" (p. 223).

(314) a. I can't meet tomorrow. My daughter is getting married.
b. I can try to meet today, but I can't guarantee that I'll be there.

This explanation is problematic in several respects. First, the scopal condition on the null pronoun is stipulated, not explained; compare the causal role that the tense head plays in mediating PC in Landau's account.

Second, the examples in (314) are far from representative; in fact, they are extremely isolated. The collocation *can meet* is quite exceptional in this respect; once the modal or the collective predicate are changed, PC fails.

(315) a. * I can't gather tomorrow.
b. * He should meet next Tuesday.
c. * Jane is able to meet tonight.
d. * I don't think George can fix this fence together.

[28] Independently, Rodrigues points out that in OC dependencies the syntactic gender of the controller is retained on embedded predicates, even when in conflict with the semantic gender, whereas NOC dependencies allow for the semantic gender of the controller to determine agreement. This contrast she takes to vindicate the movement analysis of OC. The argument, however, presupposes that the *only* syntactic vehicle of agreement is movement – surely an unmotivated assumption. Binding, Agree and predication are all equally capable of forcing full agreement in ϕ-features between their two relata. Since all major approaches to control rely on some such mechanism, operative in OC but not in NOC, the argument from gender agreement does not favor the MTC over its competitors (see Modesto 2010a for pertinent discussion).

Example (314b), in turn, hinges on the semantic flexibility of the verb *try*, which is amenable to coercion into a true irrealis verb; in that sense, *try* patterns with other desideratives in allowing *both* temporal mismatches and PC (see Wurmbrand 2001 for useful discussion). Indeed, none of the other EC predicates (aspectuals, implicatives and evaluatives) display any "modal effect."

(316) a. * The chair can start to gather in the conference room.
b. * He can't avoid to meet after what happened.
c. * It can be impolite of Bill to giggle together at the dinner table.

The facts in (315)–(316) indicate that contra Rodrigues' suggestion, modality is not an adequate substitute for semantic tense in explaining the distributional restrictions on PC.

Third, the analysis in (313) implies that the *grammatically active* [mereology] value on the embedded subject is negative (i.e., semantically singular). This is so because of the dissociation between the element in [Spec,TP] – a semantically singular DP – and the stranded *pro* in [Spec,VP]. Rodrigues explicitly claims that only the former is visible to agreement. The problem is that there are languages and dialects in which a [+Mer] DP does trigger syntactic plurality on agreeing elements; crucially, PRO in PC behaves just the same. As mentioned above, a case in point is British English, in which (300a–300c) are grammatical. Rodrigues makes a proposal about the reciprocal case, but leaves (300b–300c) unexplained.

Fourth, Rodrigues' account fails to explain why raising complements never exhibit PC. Why should the possibility of adjoining a null pronoun to the embedded subject depend on the presence of a matrix θ-position? Notice that many raising predicates are clearly modal, demonstrating again the insufficiency of the modal condition for licensing PC (see also (54) in Section 1.2).

(317) a. * We thought that the chair was likely to gather once more.
b. * We expected Bill to work together more willingly.

Fifth and finally, factive predicates do not introduce a modal context, yet PC is licensed in their complements; examples (283b), (287b) and (291a) are repeated below. This proves that modality is not just insufficient, but also unnecessary for PC.

(318) a. $I_i$ regretted [$PRO_{i+}$ killing Sam the way we did] because he was such a nice guy.
b. $Bill_i$ regretted/hated [$PRO_{i+}$ meeting without a concrete agenda].
c. Maria pensava che Gianni si fosse pentito di essersi *Italian*
Mary thought that John SI had regretted of to.be-SI
baciarti alla festa.
kissed at.the party
'Mary thought that John had regretted to have kissed at the party.'

A variant of Rodrigues' analysis is developed in Witkoś and Snarska 2009 (W&S). Assuming the *pro*-stranding mechanism, they argue that adjuncts can display a "parasitic" PC reading when preceded by a PC complement. Examples like (319) (similar ones are given in Polish) are derived as follows: (i) merging the complex [*pro* Peter] in [Spec,*gather*], (ii) raising *Peter* to the subject of the adjunct clause, stranding *pro*, (iii) merging *Peter* with a new *pro*, using sideward movement, (iv) merging the new complex [*pro* Peter] in [Spec,*meet*], (v) raising *Peter* to the subject of the complement clause, stranding the second *pro*, (vi) raising *Peter* through the matrix [Spec,*want*] to the matrix subject position.

(319) Peter$_i$ wants [PRO$_{i+}$ to meet in the barn] [so as PRO$_{i+}$ not to gather in a public place].

W&S further argue that by making this derivation possible, the A-movement theory of control accounts for the parasitic PC effect, which poses a problem for Landau's original treatment. Indeed, adjunct clauses do not normally allow PC, as shown in (320).

(320) a. * John$_i$ called up before [PRO$_{i+}$ meeting in the restaurant].
b. * Sam told me that he$_i$ would retire [after PRO$_{i+}$ working together].

In Section 6.2 below I argue that the predicational analysis of adjunct OC straightfowardly explains this restriction. But then the question is what makes (319) possible. Before answering this question, let me just point out that W&S's proposed derivation does not, in fact, account for the interpretation of (319). Notice that it is a necessary aspect of this interpretation that the group of meeters (in the barn) and the group of gatherers (in the public place) are identical. Thus, while each of these groups properly includes *Peter*, hence stands in a PC relation with it, they do not stand in a PC relation to each other. In fact, they must coincide, as in EC. However, the introduction of two distinct associative *pro*s in the proposed derivation – one stranded in [Spec,*gather*], the other in [Spec,*meet*] – fails to guarantee this coincidence; there is nothing to link the reference of these two *pro*s. Thus, the reading that W&S do generate for (319) is this: Peter wants for a group A, including him, to meet in the barn, so that a group B, including him, would not gather in a public place. This is clearly not the reading of (319), and it seems that pragmatics alone cannot guarantee that A=B.

The more fundamental question, however, is how a PC reading appears to emerge in an adjunct. In truth – it does not. The illusion arises due to the ambiguous attachment site of the adjunct in (319). The PRO$_{i+}$ reading is only available on the embedded attachment option (321a); crucially, in this option, the OC relation between the first and the second PRO is exhaustive, not partial. The matrix attachment option (321b) is underivable.

(321) a. Peter$_i$ wants [[PRO$_{i+}$ to meet in the barn]
[so as PRO$_{i+}$ not to gather in a public place]].
b. * [Peter$_i$ wants [PRO$_{i+}$ to meet in the barn]
[so as PRO$_{i+}$ not to gather in a public place]].

The challenge is to show that "parasitic" PC effects in adjuncts, indeed, only arise when the adjunct is *already embedded inside a PC complement* (hence, the control relation reduces to standard EC), and not elsewhere. For this we need to construct examples where the position of the adjunct (unlike in (319)) is unambiguous.[29]

(322) a. I preferred to meet at home despite meeting at the pub last week, but then I changed my mind.
b. * I preferred to meet at home, but then I changed my mind, despite meeting at the pub last week.
c. I preferred to meet at home, but then I changed my mind, despite hanging at the pub last week.

The parenthetical *but then I changed my mind* is naturally understood to be part of the matrix clause (specifying a contrast with the preferring event). This allows the *despite*-adjunct to be an embedded constituent in (322a) but forces it to be a matrix constituent in (322b). As a result, in the former case the local controller of the subject of the adjunct is the semantically plural PRO subject of *to meet* (i.e., *I*+others) whereas in the latter case it is the semantically singular subject of *preferred* (i.e., *I*). On the assumption that adjunct OC is always of the exhaustive type, the contrast follows (sentence (322c) shows that the single problem with (322b) is indeed the failure of PC into the adjunct and not anything else). The following pair in Hebrew demonstrates the same contrast.

(323) a. (Gil amar le-Rina še- . . . )
(Gil told to-Rina that . . . )
hu maskim lagešet la-bxina be-yaxad bli le'hitkonen
he agrees to.approach to.the-exam together without to.prepare
beyaxad, rak ki laxacu alav.
together only because pressured.3pl on.him
'(Gil told Rina that) he was willing to take the exam together without preparing together, only because he was pressured into it.'

[29] A further confound in (319) (as well as in W&S's other examples) is the use of rationale clauses. Unfortunately, these adjuncts may well fall under NOC (hence, PC is trivially available); see (440) and the discussion thereafter. The examples in (322)/(323) employ bona fide OC adjuncts.

b. (Gil amar le-Rina še- . . . )
Gil told to-Rina that . . .

hu maskim lagešet la-bxina be-yaxad rak ki
he agrees to.approach to.the-exam together only because

laxacu alav, bli le'hitkonen lifney ze / *beyaxad.
pressured.3pl on.him, without to.prepare before this / *together
'(Gil told Rina that) he was willing to take the exam together only because he was pressured into it, without preparing beforehand / *together.'

The *only-because* adjunct is construed with the matrix predicate (specifying the reason for the willingness). Its final position in (323a) allows the *without*-adjunct to attach to the complement clause; thus the PRO subject of the *without*-adjunct inherits semantic plurality from the PRO subject of *lagešet* 'to approach', itself partially controlled by the matrix subject. The medial position of the *only-because* adjunct in (323b), in contrast, forces the final *without*-adjunct to attach to the matrix clause. Being controlled by a singular subject, it resists a plural interpretation (as revealed by the contrast between the modifiers *lifney ze* 'beforehand' and *beyaxad* 'together').

If, as W&S claim, a parasitic PC effect really exists, it should surface in (322b) and (323b), contrary to fact. This supports the conclusion that (319) is misanalyzed as PC into a matrix adjunct whereas, in fact, it is a case of EC into an embedded adjunct.

An attempt at a semantic account of PC is proposed in Jackendoff and Culicover 2003 J&C. J&C argue that PC results from semantic coercion applying to the INTEND predicate inherent in certain control verbs. Specifically, a collective predicate, which is incompatible with a singular controller, triggers a shift to a *joint intention*; thus, "a member of a team has the joint intention 'WE intend to win the game and MY role is to do such and such'" (p. 548). Since intentions are future-oriented, this explains, according to J&C, why PC is only found in actional, irrealis complements.

This account fails to capture the core properties of PC. First, intention (or an underlying INTEND) is irrelevant to PC. Desiderative verbs like *want*, factive verbs like *regret* and propositional verbs like *think/claim* all license PC, without harboring an underlying INTEND predicate. Furthermore, the last two verb classes freely allow past-oriented complements, which do not intervene with PC (see (291)). Second, PC complements need to not be actional, as (288a) shows. Third, even in intentional contexts, it is not clear that PC depends on the intention being joint. In (288b), for example, the jointness of the intention is explicitly denied. Finally, PC is not triggered by collective predicates, it is merely *facilitated* by them. Embedded singular predicates readily allow PC in the right context, as shown in (288c). This casts doubt on the idea that PC comes

about through coercion, since (in J&C's view) coercion must be triggered by some semantic clash.[30]

*Further reading*

For relevant works on the topic of Section 5.2, see Wilkinson 1971, Martin 1996, Landau 2000, 2004, 2007, 2008, Wurmbrand 2002, 2003, Jackendoff and Culicover 2003, Barrie and Pittman 2004, Rodrigues 2007, Dubinsky and Hamano 2007, Bowers 2008, Madigan 2008a, Witkoś and Snarska 2009, Modesto 2010a, 2010b.

## 5.3 Split control

Unlike in partial control, the reference of PRO in split control is exhausted by the matrix arguments – but it is split between them. Most commonly it is found with verbs of proposal and communication.

(324) a. $\text{John}_i$ proposed to $\text{Mary}_j$ [$\text{PRO}_{i+j}$ to meet each other at 6].
b. $\text{John}_i$ asked $\text{Mary}_j$ [whether $\text{PRO}_{i+j}$ to get themselves a new car].
c. $\text{John}_i$ discussed with $\text{Mary}_j$ [which club $\text{PRO}_{i+j}$ to become members of].

However, it is also possible with verbs of commitment or request, in the right context (Rooryck 2007).

(325) a. $\text{Pierre}_i$ a promis à $\text{Jean}_j$ [de $\text{PRO}_{i+j}$ pouvoir partir]. *French*
Pierre has promised to John of to.be.able to.leave
'Pierre promised John to be able to leave.'

b. $\text{Piet}_i$ vroeg $\text{Jan}_j$ [om $\text{PRO}_{i+j}$ samen weg te gaan]. *Dutch*
Paul asked John COMP together away to leave
'Paul asked John to leave together.'

Split control depends on the presence of a matrix subject and a matrix object.[31] The latter may remain implicit and still participate in the control relation (see Section 5.4 on implicit control). In (326a), the implicit goal of *propose* is anteceded by the extra-sentential *Mary* and jointly controls PRO with *John*. In any event, both controllers must be local as OC requires; when one of them is not contained (even implicitly) in the clause immediately dominating the infinitive, split control fails (326b).

[30] Similarly, Roussou (2009) assumes, incorrectly, that PC only arises if the infinitive contains a collective predicate or modifier.

[31] We restrict attention to complement control, where split control is less trivial. See Section 7.1 for the possibility of split control in NOC.

(326) a. Mary$_i$ couldn't believe it. John$_j$ had just proposed ___$_i$ [PRO$_{j+i}$ to cooperate with each other].
b. Mary$_i$ was glad that John$_j$ had proposed to Bill$_k$ [PRO$_{j+k/*i+j/*i+k}$ to cooperate with each other].

One might wonder whether split control is not a special case of partial control, where the "uncontrolled" part of PRO is simply identified by another matrix argument, instead of some discourse (or a deictic) referent; this is indeed proposed in Barrie and Pittman 2004. If this were so, split control would not be worthy of its own name and category.

In fact, as Landau (2000) shows, partial and split control cannot be conflated. We have seen that PRO in partial control does not become syntactically plural (see (300)). This restriction is voided in split control; as seen in (324a–324c), PRO in split control licenses syntactically plural elements, hence must be syntactically plural itself. The contrast with partial control can be vividly seen in (327), where the same embedded predicates are excluded.

(327) a. * John told Mary that he preferred to meet each other at 6.
b. * John told Mary that he didn't know which club to become members of.

Although not very common in English, split control is much more productive in Korean (Madigan 2008a, 2008b). This is due to the fact that the split control reading is aided, or even forced, by a designated mood marker, the exhortative *ca*. In simple clauses, this marker produces a "let's do X" reading, the subject consisting of the speaker and the addressee (328a). In embedded clauses, it has the effect of split control (328b).

(328) a. Cikum ttena-ca.
now leave-EXH
'Let's (you and I) leave now.'

b. Chelsu$_i$-ka Hwun$_j$-eykey [PRO$_{i+j}$ ilbon umsik-ul
Chelswu-NOM Hwun-DAT Japan food-ACC
mek-ca-ko mal-ha-yess-ta].
eat-EXH-C tell-do-PST-DC
Lit. 'Chelswu said to Hwun to eat Japanese food together.'

Madigan shows that the embedded clause in (328b) is not a direct quote. Split control with *ca*-complements is rather productive, but not unrestricted; matrix verbs that are incompatible with a "propositive" reading do not allow it (e.g., *order*).[32]

The existence of split control is an outstanding problem for most theories of control. For this reason, the very phenomenon has been denied (Williams

[32] The same is true of Japanese. The Japanese mood marker *–(y)oo* is ambiguous between an intentive/decisive use and an exhortative one; the latter induces split control with appropriate matrix verbs (see Fujii 2006, 2010).

1980, Lebeaux 1984, Koster 1984, Wyngaerd 1994, Hornstein 1999, 2003). Yet split control exists, and importantly, possesses the OC signature (no arbitrary or long-distance control, only sloppy and *de se* readings; see Fujii 2006, 2010, Madigan 2008b for evidence). Except for syntactic number on PRO, which is not directly inherited from either one of the controllers, other syntactic features (e.g., gender) must be inherited, as shown below for Hebrew.

(329) $\text{Mixal}_{i}$ hici'a $\text{le-Galit}_{j}$ [$\text{PRO}_{i+j}$ lacet yexefot/*yexefim la-xacer].
Mixal.F proposed to.Galit.F to.go.out barefoot.F/*M to.the-yard
'Mixal proposed to Galit to go out to the yard barefoot.'

Dowty and Jacobson (1988) go as far as taking the exceptional pattern of agreement in split control as a decisive argument that agreement is a semantic phenomenon.

Predicational theories of OC fail to account for split control because a predicate cannot simultaneously apply to two distinct arguments. Binding theories fail because argumental anaphors never take split antecedents.

(330) a. $\text{John}_{i}$ met $\text{Mary}_{j}$ $\text{angry}_{i/j/*i+j}$ (*at each other).
b. * John talked to Mary about each other.

Movement theories fail to account for split control because an A-chain cannot terminate in two distinct positions. In Fujii 2006, 2010, an MTC-account is proposed that invokes rather unorthodox operations (e.g., breaking up conjunctions in the syntax). Even this account cannot explain why split control only occurs with *some* (semantically coherent) classes of control verbs and not with others, nor with raising verbs – all of which share identical surface structures.

(331) a. John offered/*ordered Mary to help each other.
b. John proposed/*committed/*seemed to Mary to help each other.

Finally, the Agree theory of control fails because agreement chains are based on feature matching and split control displays a mismatch in syntactic number.

Madigan (2008a) proposes that PRO in split control is a minimal pronoun in Kratzer's (2009) sense, derived via a SUM operator, which takes two antecedents and returns their plural sum. Madigan (2008b) briefly suggests that this operation is mediated by an addressee/speaker node in the complement, spelled out as the exhortative *ca*. This captures the semantics of split control, but leaves the syntactic questions open. As of yet, there is no satisfactory theory for the syntax of split control constructions.

### *Further reading*

For relevant works on the topic of Section 5.3, see Koster and May 1982, Petter 1998: 206–209, Landau 2000, 2007, Jackendoff and Culicover 2003, Fujii 2006, 2010, Madigan 2008a, 2008b, Lee 2009.

## 5.4 Implicit control

Postal (1970) discussed a class of examples of the following sort.

(332) a. Going there was fun/foolish/amusing/unwise.
b. Criticizing oneself fairly was difficult.
c. It was nice to shave oneself.

Postal noted that these sentences display three interpretive properties: (i) the subject of the nonfinite clause is understood as an unspecified NP (like *one*); (ii) the unexpressed argument of the matrix predicate (experiencer of *amusing*, displayer of *unwise* etc.) is understood as an unspecified NP; (iii) the two unspecified NPs co-vary. That is, *Going there was fun* means "the beings who went are the beings who had fun." He then proposed that the sentences in (332), underlyingly, project a matrix argument *one*; this argument triggers Equi (=control) of the embedded subject, and is subsequently deleted by *one*-deletion.

This was the first generative recognition and statement of what later became to be known as *implicit control*. Although the specific mechanisms have changed, the basic insight has not: PRO may be controlled by an implicit argument. Thus, the existence of implicit control has been known from the earliest studies. This point is worth stressing because subsequent work has often overlooked the phenomenon, mistakenly classifying implicit control as NOC. However, Postal saw quite clearly that "the significance of Equi is much greater than would appear at first sight. The operation of the *one* erasure rule disguises an enormous mass of cases in which Equi operates" (p. 482).

However, Postal also observed that not all cases of null "unspecified" subjects are reducible to control, citing examples like *Going there was considered*, where the implicit passive agent is inaccessible to control (or any pronominalization relation). The question whether all apparent NOC cases can be reduced to OC by implicit controllers was at the heart of the debate between Kimball (1971) and Grinder (1971). Challenging the Super-Equi Deletion rule of Grinder (1970), Kimball argued that this rule can, and in fact must, be decomposed into two distinct deletion rules: the first one is a standard Equi-NP deletion (= OC) rule, applying between the "dative" argument of an adjectival predicate and the embedded subject; the second one is a long-distance rule, deleting the dative controller under identity with a commanding NP.

(333) a. S-structure: Jones said it was necessary to see himself.
b. D-structure: Jones said it was necessary *for Jones* [*Jones* to see himself].
c. Equi-NP: Jones said it was necessary *for Jones* [Ø to see himself].
d. Dative-deletion: Jones said it was necessary Ø [Ø to see himself].

Kimball explicitly argued that subjects of nonfinite clauses cannot be deleted by long-distance or discourse antecedents. Strictly speaking, he held that NOC is an epiphenomenon, always hiding implicit OC. This extreme position shows up in later studies as well (Epstein 1984, Koster 1984, Borer 1985, Roeper 1987, Wyngaerd 1994).[33]

However, this cannot be true, as Postal's observations made clear. Grinder (1971), responding to Kimball 1971, points to examples where PRO is controlled from a preceding clause, its own matrix clause containing no potential slot for an implicit argument.

(334) $\text{John}_i$ said that [[$\text{PRO}_i$ making a fool of $\text{himself}_i$ in public] disturbed Sue].

The verb *disturb* selects two arguments, both of which are realized in (334). The only potential antecedent for PRO is the non-local matrix argument *John*. Similar examples were discussed in Section 1.4, where it was noted that except for a small class of predicates (the *rude-of* class and *easy/difficult*), no predicate imposes OC on a subject clause.

(335) $\text{Mary}_i$ thought that [$\text{PRO}_{i/j}$ to speak her/his mind] would help/please $\text{John}_j$.

Moreover, as Clements (1975) observed, NOC is available with monadic predicates, which select no dative argument (336a–336b). Note also (336c), where control by the implicit argument does not produce the attested reading.

(336) a. * To be persons would be logically inconsistent for non-persons.
b. Sophie believes that it would be logically inconsistent to be taller than herself.
c. Blaming the government is common.
[$\neq$ for unspecified x, x's blaming the government is common for x]

For a summary of arguments against the attempted reduction of NOC to implicit OC, see Constantini and Laskova 2009.

Nevertheless, Postal's prophetic comment was in place. Implicit OC does account for apparent NOC in many contexts. Complements of communication verbs have often been taken to display NOC, given examples like (337) (Bresnan 1982, Bouchard 1984, Huang 1989, Sag and Pollard 1991, Dalrymple 2001).

(337) a. John said/shouted to behave oneself.
b. Mary saw that John gestured/signaled to position herself further to the left.

[33] Epstein (1984) reformulates Kimball's analysis in terms of QR; the implicit (benefactive) argument is a *pro* that binds its own trace and the controlled PRO at LF. Borer (1985) treats the implicit argument as an operator that undergoes overt movement. See also Chierchia 1984: 301.

However, as discussed in Section 1.5, long-distance and arbitrary control in these cases are strictly mediated by the unexpressed goal argument. Once realized, it cannot be "bypassed."

(338) a. * John said/shouted to Mary to behave oneself.
b. * Mary saw that John gestured/signaled to us to position herself further to the left.

Another case of implicit OC disguised as NOC involves degree adjuncts (Wyngaerd 1994: 158).

(339) a. Sam is too angry [$PRO_{arb}$ to talk to].

b. Deze zaak is te pijnlijk voor Loes *Dutch*
this matter is too painful for Loes

[om $PRO_{arb}$ die in haar bijzijn te bespreken].
in.order.to that in her presence to discuss
'This matter is too painful for Loes to discuss it in her presence.'

Wyngaerd points out that the degree clause is an argument of the intensifier (*too*, *enough*, *rather* etc.), as it can occur with adjectives that do not normally select infinitives (e.g., *This tie is *(too) bright to wear*). The intensifier selects another argument, often implicit, which specifies the "evaluator" (e.g., the person for whom the degree is "too much"). This evaluator may well be distinct from the internal argument of the adjective (normally, experiencer of benefactive). Crucially, it is this evaluator argument (of the intensifier) that controls PRO in the degree clause. When implicit, an arbitrary reading arises. Yet this reading is simply an instance of implicit OC by an "arbitrary" local controller – exactly as in (337a).

While the evaluator argument surfaces in English as a *for*-PP, perniciously ambiguous with the argument of the adjective, in Dutch it is realized as a prepositionless dative DP. Once overt – the arbitrary reading vanishes, as expected on the implicit OC analysis.

(340) Deze zaak is **ons$_i$** te pijnlijk voor Loes
this matter is to.us too painful for Loes

[om $PRO_{i/*arb}$ die in haar bijzijn te bespreken].
in.order.to that in her presence to discuss
'For us, this matter is too painful for Loes to discuss it in her presence.'

Finally, note that implicit arguments can control into adjuncts as well. Object purpose clauses favor benefactive control over subject control (341a–341b). An implicit benefactive may even override, as controller, an overt subject in the right context (341c) (Nishigauchi 1984).

(341) a. John$_i$ bought the book [PRO$_i$ to read].
b. John$_j$ bought Mary$_i$ the book [PRO$_{i/*j}$ to read].
c. The university should provide (the students$_i$) a decent library [PRO$_i$ to work in].

There are also standard examples of implicit agent control into rationale clauses (*The ship was sunk to collect the insurance*). Whether these involve genuine implicit control is, actually, a subtle matter, to which we return in Chapter 7. We turn next to two types of purported challenges to implicit control.

### *5.4.1 Eliminating Bach's generalization and restating Visser's generalization*

Inspired by Williams 1980, Bresnan (1982) claimed that in a subset of OC environments (LFG's a "functional control"), the controller must be realized overtly. In support of this claim, she discussed (and probably named) two generalizations.

(342) a. *Bach's generalization*
Object control verbs cannot be detransitivized.
b. *Visser's generalization*
Subject control verbs cannot be passivized.

Both generalizations amount to the claim that OC controllers cannot be omitted. Given the option of implicit control, however, what these generalizations really exclude is implicit control by direct objects or external arguments. Stated this way, they look like an oddity. Implicit goals, benefactives and experiencers can control, so why not implicit direct objects (which could be experiencers!) or external arguments? As it turns out, the oddity is illusory – because the generalizations are too. Visser's generalization, however, can be restated in a way that does capture a true restriction on OC, as we will see below.

Consider first Bach's generalization, which is invoked to explain the obligatory presence of direct object controllers.

(343) a. John convinced/persuaded *(Mary) to leave.
b. We urged *(him) to live morally.

Bresnan (1982) notes that dative and oblique controllers are optional, falling under "anaphoric control" (a species of NOC). The obligatory presence of the direct object in (343) is due to its role in a "functional control" equation. Chierchia (1984) derives the same result from his predication analysis of OC (see also Rizzi 1986a).

However, a series of authors have pointed out an elementary flaw in this reasoning (Sag and Pollard 1991, Larson 1991, Williams 1991, Landau 2000: 161, Jackendoff and Culicover 2003): the obligatory presence of the direct object in (343) could be a lexical property of the verbs *convince/persuade/urge*,

independent of control. Indeed, the same verbs require a direct a object in non-control contexts as well.[34]

(344) a. John convinced/persuaded *(Mary) of a certain conclusion.
b. We urged *(him) to a moral life.

Such observations suggest that "Bach's generalization" is spurious. Examination of a broader range of facts and languages confirms the conclusion. Implicit control is, in principle, possible. In practice, different verbs, in different languages, tolerate argument omission to different degrees. However, there is no evidence that this poorly understood phenomenon – which argument of a verb may remain implicit – depends on the role of the implicit argument in control. The source of the illusion, probably, was the strong resistance of direct objects to omission. However, dative and oblique arguments may be equally resistant to omission.

(345) a. The doctor recommended *(to John) to take a rest.
b. Mary counted *(on John) to be there on time.

A word-to-word translation of (345a) into Hebrew allows implicit goal control.

(346) ha-rofe himlic (le-John) lanuax.
the-doctor recommended (to-John) to.rest
'The doctor recommended (to John) to take a rest.'

Conceivably, one could say that *recommend* and *himlic* induce different types of control in English and Hebrew; or that Bach's generalization extends to (some) datives in English but not in Hebrew. Neither suggestion is independently justified. More plausibly, Hebrew and English differ, as many languages do, in their tolerance to argument omission, a difference which may be *revealed* in OC dependencies but in no way is explained by them. Furthermore, some OC verbs not only allow the controller to be implicit but *require* this: Landau (2000: 159) mentions the impersonal English verb *prohibited* (*It was prohibited . . .*) and Stiebels (2007) mentions the German particle verb *an-ordnen* "order," both of which trigger OC by an obligatorily implicit addressee argument.

The crosslinguistic variation can be illustrated by considering how the competition between implicit control and control shift is resolved in different languages. The verb *ask* in English and its counterparts, German *bitten* and Hebrew *bikeš*, all canonically induce object control when the matrix object is

[34] Double object verbs give rise to an illusory effect of Bach's generalization.

i. John told/taught *(Mary) to smoke.
ii. John told/taught a lovely story.

The missing goal in (ii), however, may well be a dative *to*-PP and not a direct object. In contrast, the control versions of *tell/teach* disallow the dative variant.

overt. When the object is absent, however, English resorts to control shift to the subject (347a), German persists in object control (interpreted arbitrarily out of context), excluding control shift (347b) (Panther 1997), whereas Hebrew allows either option (347c) (the underline below marks the matrix implicit object).

(347) a. The mother$_i$ asked ___ $_j$ [PRO$_{i/*j}$ to wash the dishes].
b. Die Mutter$_i$ bat ___ $_j$ [PRO$_{*i/j}$ das Geschirr abzuwaschen].
the mother asked the dishes to.wash
c. ha-ima$_i$ bikša ___ $_j$ [PRO$_{i/j}$ lištof et ha-kelim].
the-mother asked to.wash ACC the-dishes

Although these may be strong tendencies and not absolute judgments, they are robust enough to raise the question – how and why do languages differ in their reliance on implicit control? As of yet there is no answer to this serious challenge.

Let us turn now to Visser's generalization (VG), as originally conceived. VG is supposed to cover the following cases (from Bresnan 1982).

(348) a. * His friends are struck (by him) as pompous.
b. * Aunt Mary was made good little housekeepers (by the boys).
b. * She was failed (by Max) as a husband.
c. * Frank was promised to leave (by Mary).

VG has troubled generative linguists since its first appearance on the stage (Chomsky 1965: 229); the literature contains numerous accounts of it (Anderson 1977, Chomsky 1977, 1980, Bach 1979, Williams 1980, Bresnan 1982, Růžička 1983, Koster 1984, Chierchia 1984, Farkas 1988, Larson 1991, Sag and Pollard 1991, Farrell 1993).

Nevertheless, the empirical status of VG is dubious. (348a) involves the raising verb *strike*, which lacks a thematic subject. This property alone, as Sag and Pollard (1991) note, is enough to rule out passivization. (348b–348c) probably do not involve control but rather predicative complements (*good little housekeepers*, *as a husband*). A well-known restriction on predication – in *contrast* to OC – is that the subject of the predicate be overt (more on this in the next section). This, again, rules out passivization, which renders the agent implicit. We are left with (348d); Landau (2000) speculated that VG is a generalization over the single verb *promise*.

Recall from (237) that under passivization, *promise* allows control shift.

(349) John was promised to be allowed to leave.

Such examples are irrelevant to VG, as they involve control shift to the goal argument (licensed under specific semantic conditions, discussed in Section 5.1.2). The puzzle about (348d) is not why goal control is unavailable (answer: the specific conditions on control shift are not met), but rather why implicit agent control (or *by*-phrase control) is unavailable.

As mentioned above, the literature offers many explanations (for extensive discussion of these explanations and their problems, see Landau 2000: 169–179). None of them, however, could deal with the fact that VG fails to hold of impersonal passives. English only has a handful of them.

(350) a. It was decided to move forward.
b. It was hoped to provide an accessible and more effective service.
c. It was planned to focus on certain sectors such as tourism.

Although *promise* itself only marginally occurs in impersonal constructions in English (see Kawasaki 1993: 105), it freely does in German and Dutch, which productively derive impersonal passives from subject control verbs; see (351a) and (351b), taken from Růžička 1983 and van Urk 2011, respectively.

(351) a. ihm war versprochen worden Hans in die
him was promised been Hans into the
Auswahlmannschaft aufzunehmen.
select-team to.include
'It had been promised to him to include Hans in the select team.'

b. Er werd geweigerd om het verdachte appelsap op te drinken.
there was refused COMP the suspicious apple.juice up to drink
'(lit.) There was refused to drink the suspicious apple juice.'

It might be objected (and it was during the 1980s) that infinitives under impersonal passives fall under NOC. The problem is that they possess the OC signature. In particular, the local agent cannot be skipped in either arbitrary or long-distance control.

(352) a. * It was decided by John$_i$ [PRO$_{arb}$ to teach him$_i$ Spanish].
b. * Mary$_i$ said that it was decided by John [PRO$_i$ to behave herself].

Thus, control under impersonal passives is obligatory, and directly contradicts VG (342b). Two other environments where implicit agents may control are interrogative complements and purpose clauses (Cutrer 1993).

(353) a. Bill asked Mary where to throw the trash.
b. Mary was asked (by Bill) where to throw the trash.
c. John built a shed to store the tools in.
d. A shed was built (by John) to store the tools in.

Cases like (353b) were hardly discussed in the context of VG because of the common assumption that interrogative complements fall under NOC. This is, however, a misconception, as shown in Section 5.2; in particular, the interrogative complement of *ask* displays obligatory, possibly partial control by the matrix subject. Note that *promise*, too, falls under partial subject control. The contrast between (348d) and (353b) is an unsolved puzzle.

Examples (353c–353d) involve implicit agent control into an adjunct. More examples of this type are cited in Roeper 1987.

(354) a. The game was played wearing no shoes.
b. The president was elected without considering his competence.

Although the wording of VG refers to complement control, nearly all the attempts to explain it appeal to the absence of a syntactic agent (rather than to the lexical nature of the control relation) – hence they extend, automatically and incorrectly, to adjunct control.[35]

Taken together, all these facts suggest that VG fails to explain more cases than it succeeds to (possibly, only (348d)). Like Bach's generalization, it reflects a conception that excludes implicit arguments from the purview of OC – a conception which cannot be maintained in view of the entire set of relevant crosslinguistic data.

A recent study, however, proposes that VG does contain a kernel of truth, if properly delimited. Van Urk (2011) observes that the crucial difference between the ungrammatical (348d) and the grammatical (350)–(351) is the fact that in the grammatical cases, the matrix T does not agree with the passivized object; rather, it displays the default 3SG agreement typical of impersonal passives. Van Urk then proposes a restricted version of VG.

(355) *Restricted Visser's Generalization (RVG)*
Implicit subjects cannot control if T agrees with a referential DP.

On this construal, according to van Urk, RVG has a broader coverage than the single verb *promise*. Consider object control verbs that shift to subject control, either pragmatically or by virtue of a semantic trigger (embedded *be-allowed-to*; see Section 5.1.2). As first observed by Ladusaw and Dowty (1988), this shift does not survive passivization – a consequence of the RVG.

(356) a. $I_i$ offered $John_j$ [$PRO_i$ to send $him_j$ money].
b. * $John_j$ was offered [PRO to send $him_j$ money].
c. The $children_i$ asked/begged the $teacher_j$ [$PRO_i$ to be allowed to tickle $her_j$].
d. * The $teacher_j$ was asked/begged [PRO to be allowed to tickle $her_j$].

As van Urk shows, the same facts emerge in Dutch, Icelandic and German. At the same time, all languages freely allow implicit subject control in *im*personal passives.

The one theory that predicts such a tight connection between morphological agreement and control is Landau's (2000 et seq.) Agree-based theory. In this theory, the features of PRO in subject control are valued by the matrix T (see Section 2.5). Van Urk further follows Landau (2010a) in assuming that implicit arguments are syntactically projected as (D-less) ϕ-bundles (see discussion in the next section). He then claims that "default" agreement in impersonal

[35] However, whether (354) are truly OC constructions is a delicate issue; some doubts are raised in Chapter 6.

passives such as (350)–(351) is really standard agreement with the external argument – a ϕ-bundle in [Spec,vP]. The ϕ-features of this "implicit subject" are interpretable, hence capable of generating "implicit subject control," but morphologically unvalued – hence the "default" morphological spellout.

Crucially, when a passivized (nominative) object agrees with the matrix T, it "takes over" the latter's ϕ-features, making them inaccessible to Agree with the implicit subject. The only control relation that T can mediate, then, is with this promoted object, as in (349) (provided the semantic conditions on control shift are met).

This appears to be the only viable account of that part of VG which is correct, namely, the RVG.[36] It crucially rests on the Agree theory of OC and on the assumption that implicit subjects are visible to ϕ-agreement. Still, two issues need to be resolved. First, how can implicit subjects control into adjuncts? Van Urk's solution invokes certain technical assumptions concerning the semantic composition of adjuncts, but this may not be needed if adjuncts fall altogether outside the purview of the Agree theory, as Landau (2003, 2007) maintains. Second, implicit subjects are visible to control into interrogative complements, as in (353b), *even though* T agrees with the passivized object, contrary to the RVG. This remains an open problem.

### *5.4.2 The representational status of implicit controllers*

The existence of implicit control is a central challenge to theories of control. The challenge goes to the heart of these theories – the grammatical representation of the control relation. The logic is very simple. Where and how implicit arguments are represented is an open, hotly debated question: they

[36] Hornstein and Polinsky (2010a) offer an explanation of VG, within the MTC, that appears to make the right cut. They analyze the goal of *promise* as a PP headed by a null P (see Section 5.1.3) and assume, with Baker, Johnson and Roberts (1989), that the passive agent is a *pro* in [Spec,vP]. To allow control by this *pro* in the passive **John was promised to leave*, two operations must take place: (i) the null P must incorporate into the verb, as in all pseudopassives; (ii) *pro* must cross over the goal [$_{PP}$ *P* John] on its way to [Spec,vP]. Cyclic derivation dictates that (i) precede (ii), however locality dictates that (ii) precede (i) (since DP arguments do, but PP arguments do not, intervene for A-movement). These incompatible demands result in the observed ungrammaticality.

This account correctly predicts that control with impersonal passives will be possible, in accordance with the RVG: in *It was promised to Mary to leave* (cf. (351a)), operation (i) need not apply as the prepositional object is not fronted. The problem is that the same account predicts *un*grammaticality under Ā-movement of the prepositional object, which, like pseudopassive, depends on prior re-analysis (incorporation) of P into V.

i. It was proposed to the students to add more classes.
ii. [To add more classes]$_i$, who was it$_i$ proposed to?

(i) allows control by the implicit agent, and the reading survives in (ii), where [V-P] re-analysis applied (note that the infinitive is fronted only to avoid an awkward '*to to*' sequence). This reveals the shortcoming of the MTC account: instead of linking the failure of implicit agent control to overt agreement with the object (the true nature of the RVG), it links it to re-analysis.

could be completely abstract entities, pragmatically inferred in specific situations; elements of conceptual structure; argument positions, or θ-roles, in argument structures (θ-grids); or bona fide null syntactic categories, pronominal or variable-like in nature (see, among others, Epstein 1984, Williams 1985, 1987, Rizzi 1986a, Chomsky 1986, Roeper 1987, Brody and Manzini 1987, Jackendoff 1987, Safir 1991, Bhatt and Pancheva 2006, Landau 2010b). Whatever answer is given, it directly bears on, and restricts, possible answers to the question "Where and how control is represented". For example, if implicit arguments can be shown to have some "syntactic life," then purely lexical accounts of control are lacking; and conversely, if implicit arguments are entirely absent from syntax, then a purely syntactic account of control will fail on generality grounds, being unable to cover implicit control.

Addressing these issues in depth is beyond our present concerns. Instead, I would like to simply provide a partial characterization of the empirical profile of implicit arguments, which should serve as a basis for further investigations.

The key question is one of visibility: which grammatical processes are implicit arguments visible to and which ones they are not? The preceding two sections have established that OC "sees" implicit arguments. The same is true of binding conditions B and C. The intended position of the implicit argument is underlined in the following examples.

(357) a. Mary talked ___ about him.
[implicit goal ≠ *him*]

b. John heard ___ about her.
[implicit source ≠ *her*]

c. The promise ___ that John would win. (Williams 1985: 306)
[implicit goal of *promise* ≠ *John*]

d. It was insulting ___ that no one helped John.
[implicit experiencer ≠ *John*]

On the other hand, the binder of an anaphor must be overt, as Rizzi (1986a) observed (358a). Thus, condition A does not see implicit arguments. As Landau (2010a) notes, the same implicit argument may control but not bind (358b–358c)

(358) a. * Il concerto di ieri ha riconciliato ___ con se stessi.
the concert of yesterday has reconciled with onself
'Yesterday's concert has reconciled with oneself.'

b. [Bill and Kevin]$_i$ told us an incredible story.
John said to them$_i$ at each other's$_i$ parties [PRO$_i$ to take off their clothes].

c. [Bill and Kevin]$_i$ told us an incredible story.
John said ___ (*at each other's$_i$ parties) [PRO$_i$ to take off their clothes].

Another syntactic relation that requires an overt antecedent is predication: bare predicates cannot be predicated of implicit arguments, as already noted in (142) (Williams 1980, Chomsky 1986, Rizzi 1986a, Chierchia 1984, 1989, Safir 1991). Examples (359a and 359c) demonstrate that a null PRO is syntactically visible to secondary predicates; examples (359b and 359d) demonstrate that implicit arguments (external or internal) are not.[37]

(359) a. They expected [PRO to leave the room angry].
b. The room was left (*angry).
c. The meat was too chewy [PRO to be eaten raw].
d. John ate *(the meat) raw. [cf. John ate]

Notice that facts like (358)–(359) constitute a very strong argument against the reduction of OC to predication or binding (see Sections 2.1–2.2). In particular, if PRO is an anaphor, or if controlled clauses are always predicates, it is a mystery why OC controllers may remain implicit.[38] The facts are equally damaging to the A-movement approach (see Section 2.4), which cannot avoid equating implicit controllers with *pro* (Boeckx and Hornstein 2004). However, quite clearly, *pro can* bind and saturate predicates (see Landau 2007 for further comments on Boeckx and Hornstein's analysis of implicit control).

It is tempting to account for the split between OC and conditions B/C on the one hand, versus predication and condition A on the other hand, by the assumption that implicit arguments are lexically but not syntactically represented. Indeed, this is pretty much the standard view, but it is not without problems (Chomsky 1986, Rizzi 1986a). First, the fact that implicit arguments are visible to condition C is hard to reconcile with a purely lexical representation. Condition C inspects unbounded configurations which are only constructed in the syntax. A purely lexical analysis of implicit arguments would be forced to assume that condition C violations are already detected at some lexical level, hence that unbounded configurations are lexically formed.

A different type of challenge to the lexical analysis of implicit arguments is presented in Landau 2010b. Landau observes that implicit arguments participate in partial control. The psych-predicate in (360a) triggers OC (see the earlier discussion of (99)/(100)), hence the partial controller in (360b) must be the local implicit experiencer. Example (360c) illustrates partial control by an implicit goal argument (identified by a discourse antecedent).

[37] These facts are crosslinguistically systematic, but may be obscured in certain languages by the availability of object *pro* drop. *pro* is a syntactic element that can bind and saturate predicates. See Landau 2010b for discussion.

[38] The argument from implicit control against the binding approach to OC was made in Rizzi 1986a and Panther and Köpcke 1993. Wyngaerd (1994), while fully appreciating the pervasiveness of implicit control, fails to recognize its damaging implications for his binding-theoretic account of OC.

(360) a. Mary realized it was embarrassing to Bill [PRO to praise himself/*herself].
b. Mary$_i$ found it embarrassing ___$_i$ [PRO$_{i+}$ to kiss in public].
c. I$_i$ told Mary that my brother in law has recently been cold to me$_i$. She said ___$_i$ [PRO$_{i+}$ to meet and talk things over].

Landau's argument is based on the premise that partial control cannot be represented lexically, since the infinitive is not predicated of its co-argument, and lexical relations cannot go beyond co-argumenthood. But if partial control is syntactic, the implicit controller in (360) must also be syntactic. This, of course, raises the question why it is still invisible to condition A and predication. Possibly, implicit arguments are featurally impoverished, compared to *pro*/PRO, which are fully specified pronominal elements. Whatever the ultimate characterization of implicit arguments is, their visibility to control points to the relative abstractness of this relation.

*Further reading*

For relevant works on the topic of Section 5.4, see Kimball 1971, Wasow and Roeper 1972, Bresnan 1982, Chierchia 1984, 1989, Epstein 1984, Koster 1984, Borer 1985, Rizzi 1986a, Williams 1985, 1987, Manzini 1983, 1986, Roeper 1987, Brody and Manzini 1987, Lasnik 1988, Clark 1990, Wyngaerd 1994, Panther 1997, Bhatt and Izvorski 1998, Petter 1998, Bhatt and Pancheva 2006, Landau 2000, 2003, 2007, 2010b.

## 5.5 PRO-gate

The phenomenon of PRO-gate was discovered by Higginbotham (1980) and figured dominantly throughout the 1980s in discussions of empty categories and syntactic variables. As theoretical concerns shifted away from these topics, interest in PRO-gate has dwindled in the past two decades. Nevertheless, the phenomenon bears significance for current debates about the "eliminability" of PRO from the grammar, and outside control theory, for the proper understanding of crossover. It certainly merits attention.

Higginbotham (1980) observed that the interaction of pronouns contained in subject clauses with variables occurring to their right displays weak crossover (WCO), as expected, but only if the subject of the clause is lexical. If the subject is PRO, the sentence is grammatical. Thus, in the (a) examples below, the matrix QP cannot (or can very marginally) bind the pronoun(s) inside the subject clause (the pronoun, of course, can receive an independent reference). This is the familiar WCO effect; e.g., ?? *His$_i$ father helped every boy$_i$*. In contrast, the pronouns in the (b) examples can be understood as variables bound by the QPs that follow them, in apparent violation of WCO. Higginbotham's

intuition was that the PRO in the (b) examples acts as a "gate" through which variable binding may proceed legitimately.

(361) a. ?? [Mary's seeing his$_i$ father] pleased every boy$_i$.
b. [PRO$_i$ seeing his$_i$ father] pleased every boy$_i$.

(362) a. ?? [Their$_i$ getting letters from their$_i$ sweethearts] is important for [many of the soldiers]$_i$.
b. [PRO$_i$ getting letters from their$_i$ sweethearts] is important for [many of the soldiers]$_i$.

(363) a. ?? [For his$_i$ wife to visit his$_i$ old neighborhood] would embarrass [someone I know]$_i$.
b. [PRO$_i$ to visit his$_i$ old neighborhood] would embarrass [someone I know]$_i$.

That WCO is indeed what is at stake in these pairs is corroborated by interrogative examples, where the same contrast emerges (cf. ?? *Who$_i$ did his$_i$ father help t$_i$*?).

(364) a. [PRO$_i$/His$_i$ getting his$_i$ car fixed] upset John$_i$.
b. Who$_i$ did [PRO$_i$ / ?? his$_i$ getting his car fixed] upset t$_i$?

Thus, the configuration (365a), with t$_i$ the trace of overt Ā-movement or QR, is blocked by whatever accounts for WCO; the PRO-gate configuration (365b) is allowed.[39]

(365) a. WCO: *Op$_i$/QP$_i$ . . . pronoun$_i$ . . . t$_i$
b. PRO-gate: Op$_i$/QP$_i$ . . . PRO$_i$ . . . pronoun$_i$ . . . t$_i$

WCO and PRO-gate are inextricably linked. Thus, accounts of PRO-gate may differ both in what they take PRO to be and in what they assume underlies WCO. The implication is that the ultimate success of these accounts depends on the ultimate analysis of WCO. Since a comprehensive discussion of the latter topic falls outside the goals of this book, I will not be able to fully evaluate the different proposals. Nonetheless, we will see that empirical constraints narrow the theoretical choices quite effectively.

The key theoretical puzzle is this: what is it about the intervention of PRO between the quantifier (or operator) and the pronoun in (365b) that obviates the violation seen in (365a)? Is it the nullness of PRO? Is it some property that distinguishes it from pronouns? From variables? Each of these options was indeed pursued, as we will see.

[39] We will shortly see that (365), with PRO binding the pronoun, is but one option; "indirect" PRO-gates are also attested. Higginbotham also observed (crediting R. Fiengo) that WCO/PRO-gate contrasts are replicated with derived nominals, suggesting that they too host PRO in their subject position (see Section 5.6.2)

i. Who$_i$ did (??his$_i$) devotion to his$_i$ country inspire t$_i$?

Higginbotham (1980) assumed, following Chomsky 1976, that WCO stems from the Leftness Condition.

(366) *The Leftness Condition*
A variable cannot be the antecedent of a pronoun to its left.

A variable, or a syntactic variable, is an *empty category* in an A-position which is locally Ā-bound (note the emphasis on empty category). "Antecedence" for Higginbotham was established by a Reindexing Rule, whereby a pronoun is reindexed to match the index of a variable to its left (367a). The rule may apply to produce a bound variable reading in (367b), where the pronoun and the variable are co-bound by the *wh*-operator, but it fails to apply in (367c) because the variable is not to the left of the pronoun.

(367) a. Reindexing Rule: in a configuration . . . $e_i$ . . . $pronoun_j$ . . . , reindex *j* to *i*.

b. [$Who_i$ [$t_i$ hates $his_j$ father]]?
*j*-to-*i* reindexing → [$Who_i$ [$t_i$ hates $his_i$ father]]?

c. [$Who_i$ does [$his_j$ father hate $t_i$]]?
* *j*-to-*i* reindexing → *[$Who_i$ does [$his_i$ father hate $t_i$]]?

To handle PRO-gates, Higginbotham suggested that the Reindexing Rule is blind to the trace-PRO distinction; *any* empty category is a potential "reindexing source." Thus, in (365b), the antecedent of the pronoun – its reindexing source – is PRO, not the trace, and since that antecedent is to the left of the pronoun, (366) is respected.

Two features of this analysis should be highlighted. First, antecedence relations must be conceived derivationally for the correct results to follow. In the ultimate LF representation of PRO-gate sentences, there is no telling which element reindexed the pronoun – PRO or the trace – since all three elements are coindexed. The directional asymmetry (allowing reindexing rightwards but not leftwards) is only detectable at a derivational stage in which the pronoun's index is independent. This kind of solution does not fit well with current assumptions. In interface-driven grammars, there are no syntactic reindexing rules, and the sole level where the well-formedness of variable binding is inspected is LF.

A second feature of Higginbotham's analysis is the idea that the crucial common denominator of PRO and trace is their being empty categories. The pronominal subject in the subject clauses of (362)–(364) fails to reindex the second pronoun precisely because it is not null and cannot trigger rule (367a).

However, the English data are open to an alternative interpretation. One may well argue that the contrast between the (a) and the (b) examples in (361)–(363) is not so much due to the nullness of PRO but rather due to its being distinct from pronouns. On this view, the nullness of the subject of the subject clause

is incidental; what is ruled out is any pronominal subject, null or overt.[40] The decisive test to distinguish the two approaches would involve a *pro* subject. This is only testable in null subject languages. Spanish data confirm that nullness of the subject is indeed not relevant; a null *pro* patterns with overt pronouns and against trace and PRO in blocking the gate and triggering a WCO violation (Safir 1984, Jaeggli and Safir 1989).

(368) ?* A quién$_i$ acusó [$_{DP}$ la mujer [$_{CP}$ con quien$_j$ [$_{TP}$ *pro*$_i$ bailó t$_j$]]] t$_i$?
Whom accused the woman with whom danced
'Who$_i$ did the woman with whom he$_i$ danced accuse t$_i$?'

A more minimal pair is provided in Terzi 1997. Recall from Section 4.1.2 that Greek is one of the languages where subjunctive complements display OC. A series of studies has taken this fact as evidence that PRO is licensed in the subject position of Greek subjunctive clauses (Iatridou 1988, Varlokosta 1993, Terzi 1992, 1997, Landau 2004). Terzi (1997) observes that subjunctive clauses may also occur in the subject position of certain predicates. If PRO occurs (or may occur) in the subject position of such subject clauses, it is expected to give rise to a PRO-gate. This expectation is indeed fulfilled. Strikingly, indicative subject clauses with a *pro* subject (Greek is a null subject language) induce a WCO violation. The contrast in (369) confirms that the PRO-gate effect is keyed to the PRO-pronoun contrast, rather than to the lexical-null contrast (note that the subjunctive mood is marked by the particle *na* and not by verbal morphology).

(369) a. Pion$_i$ nevriazi [$_{DP}$ to [$_{CP}$ PRO$_i$ na pleni to aftokinito tou$_i$]] t$_i$?
whom upset.3SG the PRT wash.3SG the car his
'Who$_i$ does washing his$_i$ car upset?'

b. ?* Pion$_i$ nevriazi [$_{DP}$ to [$_{CP}$ oti *pro*$_i$ pleni to aftokinito tou$_i$]] t$_i$?
whom upset.3SG the COMP wash.3SG the car his
'Who$_i$ does (the fact) that s/he$_i$ washes his$_i$ car upset?'

The visibility of *pro* to WCO also militates against the principle proposed in Safir 1984, the PCOB, at least on its straightforward interpretation. This principle requires variables bound by the same operator to be of the same type, where type is crucially "lexical" or "non-lexical."

(370) *The Parallelism Constraint on Operator Binding (PCOB)*
If O is an operator and *x* is a variable bound by O, then for any *y*, *y* a variable bound by O, *x* and *y* are [$\alpha$lexical].

The PCOB rules in (367b), since the pronoun is locally A-bound, not counting as a variable. It rules out (367c), where both the pronoun and the trace are

[40] A lexical subject, as in (361a), is clearly nonpronominal too, but shares no feature with PRO that would allow it to function as a "gate."

locally Ā-bound by the same operator, yet one is lexical and one is not. As Safir observes, the PCOB is superior to the Bijection Principle of Koopman and Sportiche 1982 in that it allows multiple variable binding, provided the variables are either all lexical, like resumptive pronouns (371a), or all null, as in ATB extractions (371b).

(371) a. Do you remember that guy who$_i$ everyone who knew him$_i$ hated his$_i$ attitude?
b. I know who$_i$ John likes t$_i$ and Mary hates t$_i$.

The PCOB explains the PRO-gate effect as follows. The pronoun in (365b) is not a variable, being A-bound by PRO. PRO becomes a variable at LF, just like the trace of the operator/quantifier, but since both PRO and the trace are nonlexical, the PCOB is respected.

There are two problematic aspects in this explanation: first, the extension of the notion "lexical"; second, the status of PRO as a syntactic variable.

Beginning with the first point, Safir (1984: fn. 13) realizes that unlike PRO, *pro* must count as lexical to explain WCO in (368) and (369b). To justify this consequence, he proposes that *pro* is, in fact, an unpronounced subject clitic, and that such clitics count as lexical even when unpronounced. This proposal is unappealing, and is even harder to state in current terms, where "lexical" is simply "spelled out at PF." It is hard to see how PRO and *pro* could be distinguished along these lines.

A further issue concerns the application of the term "lexical" to LF positions. Consider the WCO example (372a) with its LF (372b).

(372) a. ?? His$_i$ neighbor played with every kid$_i$.
b. [every kid$_i$ [his$_i$ neighbor played with t$_i$]].

Clearly, the PCOB applies at LF (the surface structure of (372a) contains no variables). For (372b) to violate it, the trace of *every kid* should count as "nonlexical." What is not clear is how "lexicality" can even be defined over LF representations, which are, presumably, non-phonological. Suppose the trace of *every kid* in (372b) is indeed nonlexical. Does this imply that the adjoined *every kid* is lexical? If yes, we have an unpronounced lexical position. If no, the chain <*every kid*$_i$,*t*$_i$> has no lexical content. These difficulties obviously arise because the notion of "lexicality," which is relevant to WCO, is not well-defined; and it is not well-defined because the only way to define it coherently – by reference to PF spellout – is clearly inadequate for the problem at hand. It appears that (non)lexicality is not the relevant feature that sets gates and non-gates apart. Rather, it is the fact that PRO is not a pronoun that enables the PRO-gate effect.

The second problem with the PCOB account (already hinted in Safir 1984: fn. 16) is the assumption that PRO functions as a syntactic variable at LF

(i.e., a locally Ā-bound category). This touches on an important theme in GB theory throughout the 1980s – the contextual definition of empty categories (Chomsky 1981, 1982, Brody 1984). According to this view, there is a single, undifferentiated empty category *e* in the lexicon, which is determined to be PRO, *pro*, A-trace or Ā-trace according to the syntactic environment in which it finds itself (the presence of a governor, the type of binder, its distance, etc.). This view is now obsolete, but the empirical issues surrounding the interaction of PRO with Ā-binding remain challenging as they were, and certainly deserve present-day attention.

On the classical view of PRO (enunciated in Chomsky 1981), it is a "pronominal anaphor." The features [+a,+p], importantly, are intrinsic to PRO. Syntactic variables, on the other hand, were defined as [−a,−p]. It then followed that PRO could not function as a syntactic variable. On the other hand, if contextual (rather than intrinsic) definitions are adopted, PRO will be determined to be a variable whenever it is locally Ā-bound. Moreover, in such contexts it is predicted to lack the characteristic profile of a "pronominal anaphor."

Two pieces of evidence decisively argue against a contextual "conversion" of PRO to variable. It is a curious, possibly universal feature of PRO, that it can *never* be locally Ā-bound at S-structure. The invisibility of PRO to Ā-binding stands in striking contrast to overt and even null pronouns (i.e., *pro*), which readily participate in resumption (see Jaeggli 1982: 138, 173 fn. 9, Chomsky 1986: 184, Jaeggli and Safir 1989, Safir 1996, 2004: 67–68). Note that resumptive pronouns in English are substandard, yet markedly better than PRO-resumptives. In Spanish, *pro*-resumptives are fully acceptable.[41]

(373) a. * The judge will release anyone who$_i$ it is unclear what PRO$_i$ to do.
b. ? The judge will release anyone who$_i$ it is unclear what he$_i$ did.
c. I heard about the guy who$_i$ you were wondering [when [?his$_i$/*PRO$_i$ meeting Mary] could be arranged].

(374) *Spanish*
a. * Juan$_i$, es imposible PRO$_i$ legar a tiempo.
John is impossible to.arrive to time
'John$_i$, it is impossible PRO$_i$ to get there in time.'
b. Juan$_i$, es imposible que *pro*$_i$ llegue a tiempo.
John is impossible that will.arrive to time
'John$_i$, it is impossible that he$_i$ will get there in time.'

These facts, however they are to be explained, clarify the direction of the causal dependency: rather than the context establishing the local nature of PRO, it is

[41] At least in (373c) and (374a), PRO occurs in NOC environments. The contrast with pronouns with respect to Ā-bindability argues against the proposal that NOC PRO is just *pro* (Bouchard 1984, 1985, Hornstein 1999, 2003, Boeckx and Hornstein 2007); see Chapter 7.

the intrinsic nature of PRO that restricts the range of contexts in which it can appear. This observation was probably a deadly blow to the contextual approach to empty categories.

Furthermore, from the perspective of Safir's (1984) PCOB, it is an anomaly how an element that cannot function as an S-structure variable can nonetheless acquire this status at LF. But if PRO is *not* a variable at LF, the explanation for the PRO-gate is lost. Specifically, there would not be any more reason to assign a variable status at LF to the first *his* in (375a) than to PRO in (375b). As a result, both sentences would only contain a single variable, namely, the trace (the second *his*, being A-bound, is not a variable), and the PCOB would fail to distinguish them, predicting both to be fine.

(375) a. ?? Who$_i$ did [his$_i$ getting his$_i$ car fixed] upset t$_i$?
b. Who$_i$ did [PRO$_i$ getting his$_i$ car fixed] upset t$_i$?

Thus, the PCOB account of PRO-gate crucially relies on an untenable assumption – that PRO can function as a variable.

Safir (1984), in fact, presented a second piece of evidence that even in PRO-gate environments, where PRO functions as a *semantic* variable, it retains its intrinsic, characteristic control properties. In other words, it never stops being a standard NOC PRO. This kind of PRO is known to exhibit certain locality restrictions: Although the controller need not c-command NOC PRO, it may not be c-commanded by another potential controller (376a) (see Chapter 7 for extensive discussion).

(376) a. [PRO$_{i/*j}$ training himself/*herself] helped John$_i$ appreciate Mary$_j$.
b. Who$_i$ did [PRO$_i$ training himself] help t$_i$ appreciate Mary$_j$?
c. * Who$_j$ did [PRO$_i$ training herself] help John$_i$ appreciate t$_j$?
d. [Her$_j$ training herself] helped John appreciate Mary$_j$.

Interestingly, the PRO-gate effect is constrained by the same locality restriction that selects NOC controllers, as the contrast in (376b–376c) reveals. Put differently, local Ā-binding of the null subject of a gerund cannot alleviate the restrictions imposed by control theory on the interpretation of this null subject. This makes a strong case that the null subject is a PRO element at all stages. Finally, while (376a–376c) demonstrate the invariant nature of PRO, they can hardly be taken as evidence that this nature is best captured by GB's [+a,+p] feature specification. Nothing in this specification predicts the locality restriction. In fact, a pronoun in place of PRO *would* accept the long-distance antecedent (376d).

At the same time, one should not conclude that the PRO-gate phenomenon is a trivial side-effect of control. While control theory restricts the choice of controller in NOC, independent conditions on QR may further restrict the distribution of PRO-gate. Once again, Safir (1984) provides relevant evidence.

Example (377) illustrates an uncommon scenario whereby the only potential controller is very deeply embedded. Such embedding is tolerable for NOC (by *Bill*) but certainly not for QR, which is sensitive to islands. Consequently, *every mechanic* cannot take scope over PRO at LF and no PRO-gate is observed (note that this is a scope violation, not WCO).

(377) [PRO$_i$ washing his car regularly] is just the sort of thing that shows how meticulous Bill$_i$ / *every mechanic$_i$ is.

Let us take stock. The main properties of PRO and PRO-gate emerging from the discussion so far are the following.

(378) a. In PRO-gate contexts, PRO circumvents a WCO violation by virtue of being *non*pronominal.
b. WCO violations are detected at LF.
c. PRO is an invariant element.
d. PRO is invisible to Ā-binding.

The challenging pieces here are (378a) and (378d). The ultimate explanation of PRO-gate would have to spell out the precise distinction between pronouns and PRO that exempts the latter from WCO. As to (378d), it is so far an underived empirical generalization.[42] We can appreciate the difficulty in deriving this property by looking at an attempt to do so, by Brody (1984).

(379) a. * Who$_i$ is it illegal [PRO$_i$ to see Tom]?
b. Who$_i$ did [PRO$_i$ losing his$_i$ way] annoy t$_i$?
c. ?? Who$_i$ did [his$_i$ losing his$_i$ way] annoy t$_i$?
d. * That guy$_i$, it is illegal [PRO$_i$ to see Tom].

Brody explains the failure of Ā-binding in (379a) as follows. Whether or not PRO is referential depends on its antecedent. A nonreferential antecedent would render PRO nonreferential (e.g., *It$_i$ often rains [PRO$_i$ without snowing]*). Since the antecedent of PRO in (379a) is nonreferential (a *wh*-phrase), PRO is also nonreferential; hence, it is not an argument. As such, it can neither receive a θ-role (from *see*) nor function as a variable for *who* to bind (variables must be argumental, cf. **What rains*?). In contrast, PRO in (379b) does have a referential antecedent, the *wh*-trace, which functions as the variable itself (Brody rejects the contextual definition of syntactic variables, hence PRO does not count as one). Thus, both the θ-criterion and the argumenthood condition on variables are satisfied.

[42] Safir (2004: 67) states: "The PRO-gate effects do not fit neatly into any theory of WCO that I am aware of. Apparently, PRO is never a syntactic variable, for reasons that remain mysterious." This exemption is also needed under Safir's (2004) account of WCO in terms of his *Independence Principle*.

Internally to this analysis, note that the distinction between PRO and trace – the former "inherits" nonreferentiality from its binder, the latter does not – is presupposed, not explained. Empirical considerations, however, are more damaging to this account. First, it is not clear how the contrast between (379b–379c) is captured. Presumably, the first *his* in (379c) would be a legitimate argument and variable for Brody. This means that there is no escape from reference to WCO in any account of PRO-gate. Brody's account, however, does not isolate the property of PRO that exempts it from WCO, even if it does identify a property that presumably excludes it from Ā-binding.

Unfortunately, Brody's explanation for the failure of *who* to bind PRO in (379a) does not capture the full scope of (378d). It assumes, crucially, that the binder is nonreferential. The fact of the matter is that *no* Ā-element may bind PRO, not even a referential one. This is clearly evidenced in (379d), a left-dislocation construction (see also (374a)). The θ-criterion seems irrelevant to deriving (378d), and although Brody may be right in proposing that PRO cannot function as a semantic variable, this property itself is in need of explanation, and cannot be reduced to the "nonreferentiality" of PRO's binders, however defined.

Revisiting WCO and PRO-gates, Safir (1996) proposes an improved formulation of the PCOB in (370). Recall that the main problem with the PCOB was that it made the wrong cut among syntactic variables – grouping PRO, *pro* and trace against lexical pronouns. The revision regroups these elements (excluding PRO): *pro* and lexical pronouns against trace. This correctly captures the equivalence of *pro* and lexical pronouns in WCO configurations (see (374)). The regrouping is based on the distinction between *derivational* Ā-chains, formed by movement and tailed by a trace, and *representational* Ā-chains, formed by coindexation of an operator and a resumptive element (pronoun or epithet) which are independently generated.

(380) *Ā-consistency*
An Ā-chain is consistently derivational or representational.

In a typical WCO situation, the Ā-chain consists of an operator/quantifier, pronoun/*pro* and a trace: $<Op_i/QP_i, pronoun_i/pro_i, t_i>$. The chain is inconsistent since the pronoun/*pro* is a resumptive element, part of a representational chain, whereas the trace is a residue of movement, part of a derivational chain. By assumption, such mixtures cannot be generated.

This explanation of WCO is superior to the PCOB in two respects. Empirically, it treats all resumptive elements – pronouns or epithets, overt or null – as one type, which may not be mixed with traces in the same Ā-chain. This appears to be descriptively true. Conceptually, Ā-consistency improves on the PCOB in that it offers a genuine explanation for what it is about WCO configurations that makes them ungrammatical. Uniformity in terms of the feature [αlexical]

does not follow from anything. In contrast, it makes perfect sense that a chain can only be formed in a single way – either by movement or by coindexation. It could even turn out that the former pre-empts the latter on economy grounds (Shlonsky 1992).

Nevertheless, Ā-consistency in itself does not explain why PRO, unlike *pro*, *can* be paired with a trace, as in a typical PRO-gate; surely PRO is not a residue of movement.[43] Indeed, Safir explicitly states that the account must be supplemented by the underived stipulation (378d). If PRO does not count as a syntactic variable, then the only variable would be the trace (the pronoun inside the gerund being A-bound), and Ā-consistency would be trivially satisfied.

A rather different approach to PRO-gate and WCO phenomena is pursued in Demirdache (1991: 87–89). Demirdache attributes crossover violations to the need of traces (but not pronouns) to be *locally* Ā-bound. In Strong Crossover, the trace is locally A-bound by the pronoun. In Weak Crossover, it is also locally A-bound, this time indirectly by the maximal projection immediately dominating the pronoun. Indirect binding is obtained by adding the index of a variable as a second *slash index* to the minimal maximal projection that dominates it (Haik 1984). Thus, indirect binding is the process by which the locality of Ā-binding of traces is disrupted in WCO. Furthermore, deeper embedding of the pronoun suspends the WCO violation because the slash index can only be "passed up" to the closest maximal projection.

(381) * Who$_i$ does [his$_i$ mother]$_{j/i}$ love t$_i$?

Demirdache dispenses with assumption (378d) and takes PRO in PRO-gate environments to be a variable. The difference with lexical pronouns arises not due to their different constitution, or their overtness, but rather due to their position. Specifically, an overt pronominal subject of a gerund raises to [Spec,DP] for case reasons whereas a PRO subject remains in its base-generated VP-internal position.

(382) a. [$_{DP}$ his$_i$ D [$_{NP}$ -*ing* [$_{VP}$ t$_i$ get his$_i$ car fixed]]]$_{j/i}$
b. [$_{DP}$ D [$_{NP}$ -*ing* [$_{VP}$ PRO$_i$ get his$_i$ car fixed]]]$_j$

Because the possessive pronoun in (382a) is immediately dominated by the maximal projection of the gerund (a DP), the latter inherits a slash index from the former. This way, the gerund indirectly A-binds the matrix object trace in (375a), blocking local Ā-binding and leading to a WCO violation. In contrast, the gerund DP does not inherit an index from PRO in (382b) since two maximal projections (VP and NP) intervene between them. Indirect A-binding is diverted and the trace in (375b) is locally Ā-bound.

[43] At least not on Safir's assumptions. We discuss below the A-movement analysis of PRO-gate.

One may question whether the structural distinction between (382a–382b) is independently motivated (e.g., does PRO in gerunds fail to take scope above the internal VP?). At any rate, Demirdache's analysis differs from other approaches in two important respects. First, the WCO violation is crucially linked to the possessive (subject) pronoun in the gerund. This falsely predicts that the violation would go away whenever there is no such pronoun. In fact, however, Higginbotham's original data included examples like (361a), where the gerund's subject is a proper name and the offending pronoun is too deeply embedded to be able to transmit a slash index to the gerund. Similarly, a *for*-infinitive is a CP, which does not immediately dominate its pronominal subject (an IP projection intervenes). Failure of indirect binding would predict WCO obviation, contrary to fact (see (363a)). Finally, the assumption that PRO can function as a variable (for the purposes of slash indexing) is at odds with data like (373a)/(374a)/(379a, 379d).

On the other hand, a second feature of Demirdache's proposal allows it to handle data that are problematic to all the other proposals. Notice that the "redeeming" quality of PRO in PRO-gate configurations inheres neither in its intrinsic properties nor in its referential value; it is merely its low position (in (382b)) that bleeds indirect A-binding of the trace by the subject gerund. The prediction is that PRO-gate effects will show up regardless of the reference of PRO. Surprisingly, this seems to be the case, as we shortly discuss.

Within minimalism, an early account of PRO-gate is found in Ruys 1994. Ruys proposes to derive WCO and PRO-gate from global economy – a preference for a derivation with shorter chain links over one with longer chain links, if both yield identical interpretations. A typical WCO violation (383a) is blocked because an alternative derivation is available (383b), yielding the same interpretation (383c), where the operator movement is shorter (the subject is closer to Spec,CP than the object).

(383) a. ?? Who$_i$ does his$_i$ mother love t$_i$?
b. Who$_i$ t$_i$ loves his$_i$ mother?
c. For which person x, x loves x's mother.

The logic of economy dictates that whenever no alternative, semantically equivalent derivation with shorter links exists, WCO will not be attested. This, according to Ruys, is what allows PRO-gate in (384a). Alternative (384b), with the QP and the pronoun swapped, yields the same interpretation, but violates Strong Crossover (the QP is A-bound by PRO). Alternative (384c), with the QP replacing PRO and a pronoun replacing QP, would *not* yield an equivalent interpretation; the DP with a QP subject is interpreted as a strong DP, unlike the one with a PRO subject, which is weak; see (384d) vs. (384e).

(384) a. [PRO$_i$ devotion to his$_i$ country] inspires every soldier$_i$.
b. * [PRO$_i$ devotion to every soldier's$_i$ country] inspires him$_i$.
c. ≠[every soldier's$_i$ devotion to his$_i$ country] inspires him$_i$.
d. * There was [every soldier's$_i$ devotion to his$_i$ country] in his eyes.
e. There was [PRO$_i$ devotion to his$_i$ country] in every soldier$_i$'s eyes.

Note that Ruys' account predicts that WCO will be obviated whenever the pronoun is sufficiently embedded (i.e., inside an island) so that an operator in the same position would not be able to take matrix scope (hence, no competing alternative derivation exists). This prediction is probably too strong (cf. (368)). More importantly, it is not clear how the interpretive effect of QP subjects can be established with verbal gerunds (as opposed to derived nominals like *devotion*), whose "definiteness" is undefined. At any rate, transderivational global economy has been seriously discredited in current syntactic theory, to the point that it is no longer considered a viable explanation.

The most prominent minimalist attempt to explain PRO-gate was carried out within the Movement Theory of Control (MTC) (Hornstein and Kiguchi 2003, following Kiguchi 2000, Hornstein 2003). The explanation is summarized below.

(385) *MTC's account of PRO-gate*
a. A-movement circumvents WCO (i.e., a pronoun bound by an A-trace will not violate WCO).
b. PRO in OC is an A-trace.
c. PRO in subject gerunds displays OC.
d. Therefore, PRO in subject gerunds circumvents WCO (= PRO-gate).

(385a) is well-established; e.g., *Who$_1$ $t_1$ seemed to his$_1$ wife $t_1$ to be clever*?). (385b) is the core claim of the MTC, which has attracted much criticism.[44] For the sake of discussion, let us grant it. The novel empirical claim in Hornstein and Kiguchi's work (henceforth, HK) is (385c). The idea is that A-movement is also allowed sideward; before the subject gerund is merged with the matrix predicate, its own subject is A-moved to become the matrix controller (on sideward movement, see Nunes 2004). If the MTC is the right analysis of OC, and if (385c) is descriptively true, then (385) offers a genuine, novel account of PRO-gate.

Sidestepping the status of the MTC, however, (385c) is false. Other than isolated and well-defined exceptions (see (102)–(103) in Section 1.5), PRO in subject gerunds displays NOC, which is subject to complex pragmatic restrictions; see Chapter 7. Landau 2007 contains a detailed critique of HK's explanation; we summarize his main points below.

[44] See Landau 2003, 2006, 2007, Bobaljik and Landau 2009, Culicover and Jackendoff 2001, Jackendoff and Culicover 2003, Kiss 2004, Barbosa 2009, Ndayiragije 2012, Wood 2012.

HK claim that a local DP – usually the matrix object – obligatorily controls the subject of a subject gerund. Thus, extrasentential control is excluded (386a), split control is excluded (386b), and a strict reading under stripping is excluded (386c).

(386) a. * [$PRO_i$ shaving himself] impressed $Mary_j$.
b. * $John_i$ hopes that [$PRO_{i+j}$ shaving themselves] made $Mary_j$ happy.
c. [$PRO_i$ shaving every morning] bothers Tom but not Bill.
(subject of the stripped conjunct = Bill shaving every morning, not Tom shaving every morning).

The problem is that context makes all the difference for NOC. Placed in the right context, a subject gerund can easily pick a non-local controller *even in the presence of a local DP*. The non-local controller can occur in the preceding discourse (387a), the deictic context (387b) or even in the following discourse (387c–387d) (we return to all these examples in Chapter 7).

(387) a. $John_i$ said that [$PRO_i$ making a fool of himself in public] disturbed Sue.
b. $PRO_1$ shaving $myself_1$/$yourself_1$ impressed Mary.
c. [That [$PRO_i$ exiling himself] might grieve the Queen] never occurred to the $minister_i$.
d. [$PRO_i$ storming out of the room that way after losing the game] convinced everyone that $John_i$ is very immature.

The alleged ban on split antecedents is also undermined by examples where the local DP is but one "half" of a split controller.

(388) a. [That [$PRO_{i+j}$ covering themselves with mud] disturbed $Spiro_i$] amused $Dick_j$.
b. $John_i$ told $Bill_j$ that [$PRO_{i+j}$ shaving themselves] would upset everyone.

And in the right context, stripping allows for a strict reading of the elided PRO.

(389) a. Flirting around amused Bill, but not his wife.
b. Flirting around amused Bill, but offended his wife.
(subject of the stripped conjunct = Bill flirting around, not his wife flirting around)

Thus, there is solid evidence that even in the presence of a local matrix DP, subject gerunds display NOC (see Landau 2007 for further evidence concerning strict readings under *only*-DP and *de re* readings). But if (385c) is false, the reduction of PRO-gate to A-movement breaks down.

The problem for the MTC is, in fact, deeper. Not only does the explanation of PRO-gate not go through, but more seriously, none of the examples in (387)–(389) can be generated. A crucial ingredient in the MTC's analysis of local control as OC is the economy dictum "Merge over Move." That is, whenever a choice exists between merging a new item from the numeration into position

T and moving an item from the current structure to position T – the former option wins (Move being more costly than Merge). For this reason, sideward movement of the gerund's subject can only occur *after* all the DPs in the numeration have been exhausted. In contrast, what (387)–(389) show is that the location of the controller is not uniquely determined; which implies, for the MTC, that the timing of sideward A-movement is unpredictable and does not respect "Merge over Move."[45]

The alternative, within the MTC, is to concede that subject gerunds fall under NOC. But this alternative runs into its own problems. Recall that NOC in the MTC is reduced to pronominal reference; the null subject is taken to be *pro*. This would indeed explain the lack of strict locality in (387)–(389), but would fail to explain the two peculiar properties of PRO that are the focus of this section (see (378a, 378d)): (i) Why is PRO *different* from *pro* in obviating WCO? (ii) Why is PRO *different* from *pro* in being invisible to Ā-binding?

So far we have seen that no existing account of PRO-gate is free of problems, either empirical or conceptual. Even the most successful account, Safir's (1996), must avail itself of an underived stipulation (the invisibility of PRO to Ā-binding). But the puzzle of PRO-gate is even greater. In the remainder of this section I will present little-discussed data that indicate, quite strongly, that *all* the previous accounts of PRO-gate have been misguided.

A basic premise about the empirical scope of PRO-gate is the following: for PRO to act as a gate (i.e., obviate a WCO violation), it must be controlled by the operator (quantifier) that binds the pronoun. Indeed, all the grammatical PRO-gate examples in this section have this property. Schematically, the assumption includes configurations (390a) but not (390b) under the PRO-gate effect.

(390) a. $Op_i/QP_i \ldots PRO_i \ldots pronoun_i \ldots t_i$
b. $Op_i/QP_i \ldots PRO_{j\neq i} \ldots pronoun_i \ldots t_i$

That (390a) and not (390b) produces PRO-gate is a theorem of nearly all existing accounts, whether they involve the Reindexing Rule (Higginbotham), A-binding of the pronoun (Safir) or A-movement of the controller from the

[45] In further support of their A-movement analysis of PRO-gate, HK claim that whenever sideward movement is blocked – e.g., when the subject gerund is inside an island – NOC emerges and with it, WCO effects (i). However, these facts are murky. To recall, Ruys (1994) observed that WCO violations tend to improve when the pronoun is deeply embedded (ii), and his analysis in fact *predicts* that inside islands, pronouns would not trigger violations. Landau (2007) cites (iii) as grammatical, an example which is structurally equivalent to (i) at LF. Until more systematic data are collected, then, such examples do not establish the MTC's prediction.

i. ?? $Who_i$ does $[_{DP}$ the fact that [$PRO_i$ cooking $his_i$ lunch is mandatory]] annoy $t_i$?

ii. I wonder $who_i$ [the fact [that $his_i$ mother loved $him_i$]] prevented $t_i$ from committing murder.

iii. [The fact that [$PRO_i$ losing $his_i$ life is a distinct possibility]] frightens every $soldier_i$.

position of PRO (Hornstein and Kiguchi). The single exception is Demirdache 1991, where the index of PRO plays no role in the explanation of the PRO-gate effect.

Yet this assumption is factually incorrect. Three types of examples demonstrate that PRO-gate is possible under configuration (390b).

First, the Op/QP may be a constituent of the controller. Such examples were first noted in Safir 1984.

(391) a. [$PRO_j$ witnessing $his_i$ grading procedure] upsets [some female student of [every professor]$_i$]$_j$.
b. ?? [$His_i$ grading procedure] upsets [some female student of [every professor]$_i$]$_j$.

To deal with such facts (and more generally, with QPs scoping out of bigger QPs), Safir introduces the notion of Q-chain. Informally, a Q-chain is a sequence of quantifiers in which every QP binds a trace inside the following QP. A *Slash Indexing Convention* adds the index of the initial QP to the ultimate variable(s) of the final QP. In the LF of (391), the initial QP is *every professor* and the ultimate variables are PRO and the matrix object. Thanks to the index */i* on PRO, *his* is A-bound and is ignored by the PCOB (370).

(392) *LF of (391a)*
[every professor]$_i$ [some female student of $t_i$]$_j$ [$PRO_{j/i}$ witnessing $his_i$ grading procedure] upsets $t_{j/i}$.

In Safir 1996 the idea that PRO can function as a variable is rejected (for good reasons, as we saw above). Therefore, the appearance of the slash index on PRO is attributed to control (by the trace $t_{j/i}$) rather than to Ā-binding by the Q-chain. Safir (1996) presents (393) as evidence that it is indeed control by the *containing* QP that is the vehicle of the special slash index; when the binder of the pronoun is not contained in the controller (393b), WCO resurfaces ((393c) shows that widest scope for the universal QP is in principle possible from its surface position).

(393) a. [$PRO_j$ hating $its_i$ weather] gets [someone in [every eastern city]$_i$]$_j$ to move west each year.
b. ?? [$PRO_j$ hating $its_i$ weather] gets $Bill_j$ to denounce [every eastern city]$_i$.
c. An expert got Mary to buy every antique in her collection.

These intriguing facts, if systematic, would indeed reveal that the deeper source of PRO-gate effects is not the mere presence of PRO (as opposed to a pronoun) but rather the *control* relation in which this PRO is involved. Exactly how control by the matrix object conspires to exempt examples like (391a)/(393a) from WCO, however, would remain to be spelled out.

There is reason to believe, however, that local control is not fundamentally implicated in PRO-gate; correspondingly, that the Slash Index Convention is

too narrow a device to capture the full range of PRO-gate configurations. Two pieces of evidence suggest this.

First, PRO-gate is possible with arbitrary PRO, a fact first noted in Landau 2007 (though see Authier 1989 for the contrary view).

(394) a. [$PRO_{arb}$ respect for $his_i$ efforts] encourages every $student_i$.
b. [$PRO_{arb}$ failing to appreciate $his_i$ difficulties] would frustrate any $child_i$.

Second, for some speakers at least, PRO-gate is possible in long-distance control (these facts, I believe, have not been documented in the past).

(395) a. $Mary_j$ felt that [$PRO_j$/??$her_j$ introducing herself to $his_i$ superior] would annoy every $employee_i$.
b. $Mary_j$ wondered which $employee_i$ [$PRO_j$/??$her_j$ introducing herself to $his_i$ superior] would most annoy $t_i$.

These judgments should be explored more extensively, but if they are representative, they pose a fatal challenge to nearly all existing accounts of PRO-gate. The reason is that the gate here, as schematized in (390b), is independent of the two Ā-variables (the trace and the pronoun). Hence, it is not clear by which mechanism it obviates WCO.[46]

To conclude, research on PRO-gate has produced a number of significant findings, as stated in (378), which constrain both theories of what PRO is and theories of what WCO is. At present, however, the phenomenon, taken in its full empirical range, has resisted all theoretical analyses.

*Further reading*

For relevant works on the topic of Section 5.5, see Higginbotham 1980, Brody 1984, Safir 1984, 1996, 2004, Jaeggli and Safir 1989, Clark 1990, Demirdache 1991, Ruys 1994, Hornstein and Kiguchi 2003, Landau 2007.

## 5.6 Control in DP

The manifestation of control in DP breaks down to several separate issues. First, in line with the old intuition that DP structure mirrors clausal structure, the question arises whether DP can host a null subject; next, what type of category is it, and finally, how is control expressed inside nominals?

In Section 5.6.1 I discuss a battery of tests confirming the syntactic reality of a null subject in nominalizations. Before presenting this evidence, a number of arguments against PRO in DP will be discussed and dispelled, as well as a

[46] Note that Safir's (1996) example (393b) points in the opposite direction (i.e., that local control *is* implicated in PRO-gate). These issues await resolution.

few pseudo-arguments for it. In Section 5.6.2 I discuss arguments bearing on the nature of this null subject – specifically, is it a PRO or a *pro*? We will see that the question is complex and pretty much undecided yet. In Section 5.6.3 I turn to a different question: how does control operate inside DPs, in particular, when an argument of the head N controls into an infinitival clause (either a complement or adjunct of N)?

### *5.6.1 Evidence for a null subject in DPs*

The most concentrated effort to disprove the "PRO in DP" hypothesis is found in Williams 1985. Reviewing his arguments below, we will conclude that Williams' conclusion was not fully justified. While underived nouns may lack a syntactic null subject, nothing in Williams' observations rules out a syntactic null element in the subject position of derived nominals. For the most part we will follow common practice and take this element to be PRO. However, whether it is in fact PRO or *pro* is far from clear, as we will see later on.

Williams first observes an interesting asymmetry in the choice of controller into adjuncts. When the adjunct is clausal (a gerund), subject control is forced (leading to the anomalous reading of (396b) with *desiccating*). When the adjunct is a DP, either the matrix subject or object may control.

(396) a. The leaves should not be bothered during desiccation / while desiccating.
b. You should not bother the leaves during desiccation / * while desiccating.

Williams claims that this asymmetry "makes the NP PRO suspect," but does not elaborate why. Perhaps the underlying assumption is that PRO requires a c-commanding controller. Since objects do not c-command adjuncts, the understood subject of *desiccation* in (396b) cannot be PRO. The problem with this reasoning is that objects do, famously, c-command into right-edge adjuncts for the purpose of binding, e.g., *The police arrested John and Bill during each other's parties*. Furthermore, even if Williams' argument rules out a PRO in DP, it does not rule out a *pro* in DP (since antecedents for pronouns need not c-command them). Thus, his argument is neutral on the question of whether DPs contain structurally represented null subjects.

Williams' arguments were mostly concerned with showing that the understood subject of DPs is not controlled in the sense familiar from clausal control, although it could enter referential dependencies that sometimes mimic control. The logic was based on parsimony: the "PRO in DP" hypothesis is superfluous, since it leaves unexplained all the important facts. Thus, it does not explain why PRO must be present in (397a–397b) (to explain condition B/C effects) but absent in (397c) (a PRO there would be the story-tellers, distinct from *they*, leaving the anaphor locally free). Nor does it explain how PRO can escape control in (397a), unlike PRO in complement clauses.

(397) a. They$_i$ heard [PRO$_j$ stories about them$_{i/k/*j}$].
b. [The PRO$_{j/*i}$ realization that John$_i$ was sick] upset him.
c. They heard [stories about themselves].

Expanding on these observations, Chomsky (1986: 166–167) discusses the following examples.

(398) a. They$_i$ heard [PRO$_j$ stories about them$_i$].
b. They$_i$ heard [stories about each other$_i$].
c. * They$_i$ told [PRO$_i$ stories about them$_i$].
d. They$_i$ told [(PRO$_i$) stories about each other$_i$].

Condition A requires a subject in the binding domain. If PRO is projected inside the object DP, that DP is the binding domain; otherwise, the matrix clause is. *Hear* and *tell* differ in that the former requires the understood subject of its object to be disjoint from the matrix subject whereas the latter requires identity (or control). This indexing contrast explains why condition B rules out (398c) but not (398a). Note that there is no analogous "obviative" PRO in clausal complements; these necessarily fall under OC (see Sections 1.5, 1.6).[47]

Furthermore, as Williams noted, unlike in clauses, PRO is not obligatory: the grammaticality of (398b) can only be explained if the counter-indexed PRO is suppressed ((398d) is licensed by condtion A with or without PRO).

An alternative view of these facts could be that PRO is never projected as the subject of underived nouns. The one case where PRO appears to be necessary, (398c), is explained if condition B applies at a semantic level where the author of the stories is invoked. In (398b, 397d) the binding domain of the anaphor is the entire matrix clause (and the reference of the implicit author of the stories is calculated from lexical semantics and context).

Further evidence against a PRO subject in underived nouns comes from the following facts, also from Williams 1985.

(399) a. John took [a picture of Mary].
b. John took [Mary's picture].
c. John took [his first picture yesterday].

The understood maker of the picture is *John* throughout, but only in (399a) is there an empty syntactic position – [Spec,NP] – to host a PRO that could mediate this construal. Williams' conclusion is that the association of the agent of *take* and the maker of its theme argument is stated directly over θ-grids (or argument slots) and not over syntactic positions, as in control.[48]

[47] Recall that the apparent disjointness of PRO from the subject in *John$_i$ said [PRO$_{j/*i}$ to hide quickly]* is a side-effect of implicit control by the matrix goal, which is itself disjoint from *John*. This point was already recognized in Postal 1970: 472; see Sections 1.6, 5.4.

[48] How much of these associations is lexically rigged is not so clear. Consider the verb *undergo*, which, according to Williams (1985), associates its subject with the patient role of its

One of Williams' less compelling arguments is based on control by the alleged PRO in NP.

(400) Any/Yesterday's attempts (by them) [PRO to leave].

Since [Spec,NP] is filled in (400), Williams reasons, the controller of PRO in the infinitive (that is, the attempter) cannot be PRO itself and must be an implicit argument. While this is certainly one possible scenario (on implicit control, see Section 5.4), it is by no means necessary. Current views on DP structure allow for a PRO controller in (400). *Any* is a Q head; either its own specifier or the specifier of its NP complement could host PRO. And the possessor adverbial *yesterday's* need not rule out an additional, possessor argument realized as PRO (e.g. Roeper's (1993) examples, *One man's week's work is another man's year's achievement, Boston's President's welcome was better than New York's mayor's homecoming*); in fact, Giorgi and Longobardi (1991: 249, fn. 32) explicitly argue that the uniqueness of [Spec,DP] in English only holds for *arguments*, not for adverbials.

It is sometimes suggested that the blocking of control into nominals by the definite article is evidence for PRO (Roeper 1993).

(401)
a. John enjoyed falls from the airplane. ⇒ John falls
b. John enjoyed the falls from the airplane. ⇒ somebody falls
c. John was in control of the army. ⇒ John controls the army
d. John was in the control of the army. ⇒ The army controls John

These intriguing contrasts, however, do not establish the presence of PRO in (401a, 401c) or its absence from (401b, 401d). Why should a definite determiner under D rule out a controlled PRO in [Spec,DP]? Perhaps (401a, 401c) project a controlled PRO and (401b, 401d) an arbitrary PRO; perhaps no PRO is ever projected here and the interpretive contrasts are semantically explained. Evidence for PRO qua a syntactic element should, indeed, be syntactic.

Indeed, Roeper (2000) retracts his earlier claim that bare nouns host a controlled PRO subject and instead handles their interpretation by "Role Control" (essentially going back to Williams' 1985 θ-association). The main reason for this shift was a comparison with "retroactive gerunds." As Clark (1990) observed, when occurring under verbs like *need*, *merit*, *deserve*, *could use*, etc., the object of these gerunds is necessarily "linked" to the matrix subject. Since a possessor in the gerund is excluded, Clark concluded that the link is established

object (i). As Safir (1987) shows, this relation could be rather indirect, tolerating a distinct patient argument in the nominal (ii); see also (iii), from Roeper 1987.

i. John underwent an operation. (⇒ patient of operation = John)
ii. John underwent Mary's egregious performance of the symphony.
iii. John's body underwent destruction of the liver.

by (i) object-to-subject movement of PRO inside the gerund, and (ii) subject control of PRO.

(402) a. John$_i$ needs [PRO$_i$ helping t$_i$].
b. * John needs Mary's helping.
c. John$_i$ could use [PRO$_i$ a good looking at t$_i$].
d. * John could use [a competent psychiatrist's looking at].

In contrast, a possessor does not block "Role Control" into other nominalizations.

(403) a. John needs (Mary's) help.
b. The crisis merits (the government's) attention.

Roeper (2000) concluded, then, that (401)/(403) do not involve PRO but rather "Role Control," which is blocked by an intervening DP node; the latter is introduced by the definite article in (401b, 401d), though not by the possessor in (403).

Let us turn now to solid arguments that do point to the presence of a syntactic null subject in nominalizations (see Giorgi and Longobardi 1991: Chapter 4 and Longobardi 2001 for extensive pertinent discussion). The logic of such arguments should be familiar from Section 3.2, where the existence of PRO in infinitives was established: certain generalizations that make reference to syntactic subjects would be lost if nominalizations were *not* to have null subjects.

First, as seen above in (142), secondary predicates can only be saturated by a syntactic DP, implicit arguments being insufficient. As Safir (1987) observed, the understood subject of a nominalization can saturate a secondary predicate, hence must be projected in the syntax.

(404) [PRO discussion of these issues *stoned*] rarely produces satisfactory results.

Second, agreement phenomena can detect the presence of a syntactic subject. This is more transparent in languages with richer agreement than English. In the Hebrew example below, the (conjoined) predicate nominal *ke-šutafot velo ke-yerivot* 'as partner.PL.FEM and not as adversary.PL.FEM' occurs inside a nominalization headed by *avoda* 'work'. At the same time, it refers to the subject of a preceding sentence, *the women*. Since the two items belong to different sentences, and a phi-distinct subject intervenes between them (*Yosi*, 3SG), this cannot be a case of direct agreement. Nor can it be default agreement, which is masculine in Hebrew. The only plausible trigger of PL.FEM agreement on the predicate nominal is a null subject inside the bracketed nominalization, i.e., the agent argument of *avoda* 'work', projected as PRO, which is controlled (under NOC) by the matrix subject.

(405) ha-našim$_i$ ta'anu še-Yosi to'e. [PRO$_i$ ha-avoda ke-šutafot
the women claimed that-Yosi wrong. the-work as-partners
ve-lo ke-yerivot] rak kidma et ha-proyekt.
and-not as-adversaries only advanced ACC the-project
'The women claimed that Yosi was wrong. Working as partners rather than adversaries only advanced the project.'

Third, as is well-known, the understood subject of nominalizations is visible as a binder. We illustrate below conditions A and C (the examples are from Williams 1987 and Ross 1969, respectively): the anaphor in (406a) is bound by the "respecter" and the "knower" in (406b) must be disjoint from *Fred*.

(406) a. [PRO respect for oneself] is important.
b. [The PRO$_{i/*j}$ knowledge that Fred$_j$ will be unpopular] doesn't bother him.

An obvious alternative is that binding can "see" implicit arguments (e.g., θ-slots in the argument structure), which would imply that the effects in (406) do not establish the *syntactic* presence of PRO (Williams 1985). The alternative is dubious for condition C, which applies non-locally; presumably, lexical relations – and θ-slots *are* lexical entities – are confined to a single argument structure (Landau 2010a).[49] As to condition A, there are strong empirical reasons to doubt that it can access implicit arguments as binders (Rizzi 1986a), as already illustrated in (358) above. This is so both for implicit agents of passives (407a) and implicit goals (407c) (note that the goal of *listen* is in principle omissible, i.e., possibly implicit, (407b)).

(407) a. * This book was read to himself / * This book is usually read to oneself.
[himself/oneself ≠ implicit reader]
b. She listened (to them) during the party.
c. She listened *(to them) during each other's parties.

Notice also the possibility of reciprocal binding, which testifies to the presence of a plural binder. Since "split antecedents" are excluded for reciprocals (cf. (153)), a PRO binder is motivated in (408a). Since the overt antecedent is too low in (408b) (from Baltin 1995), a PRO binder is motivated there too.

(408) a. John$_i$ reminded Mary$_j$ how fruitful [PRO$_{i+j}$ cooperation with one another] had been.
b. [This PRO$_i$ hatred of each other$_i$] is ultimately destructive to both of you.

[49] The argument from condition C is bolstered in Sichel 2009, where the implicit subject of the nominalization triggers a disjoint reference effect on a null, existential impersonal subject of a finite complement inside the nominalization. Sichel argues that such null impersonal subjects are equivalent to bare plurals, whose susceptibility to condition C cannot be deduced from pragmatic preferences. Hence, the binder – the implicit subject of the nominalization – must be syntactic.

Similar data to (406a) are observed in Italian; the anaphors receive an arbitrary interpretation because the null subject of the nominalization is generic (Giorgi and Longobardi 1991: 138).

(409) L'acquisto di questa droga solo per se stessi / per sé / per la propria
the.purchase of this drug only for onself / for self / for self's
famiglia non è un reato.
family not is a crime
'The purchase of this drug only for onself / one own's family is not a crime.'

The null subject of the DP need not be generic. If an overt antecedent is available, the subject could be personal and bind personal anaphors. Consider the following interesting English pattern, also from Giorgi and Longobardi (1991: 140).

(410) a. John's placement of me next to him / himself.
b. The placement of me next to him / himself was John's main concern.
c. My placement next to him / *himself was John's main concern

Either the pronoun or the anaphor are acceptable in (410a–410b). Importantly, the anaphor in (410b) must be bound by a null subject (itself coreferent with *John*). Because the null subject occupies the prenominal possessor position, anaphor binding fails in (410c), where this position is already filled. Thus, we have strong evidence both for the idea that anaphoric binding applies to *syntactic* representations and for the reality of a null subject in nominalizations (lacking an overt subject).

The logic of using passive nominalizations to block the projection of a null subject in DPs was applied extensively by Giorgi and Longobardi (1991) and Longobardi (2001), precisely in order to bring out the syntactic reality of this null subject. The argument is intricate, but compelling. Observe first that in DPs as in clauses, objects cannot control into adjuncts (411a) unless promoted to subject position (411b) (in Italian, the latter corresponds to a prenominal position reserved for possessive pronouns).

(411) a. ?* Disapprovo l'attribuzione **del premio**$_i$ a Maria
[dopo PRO$_i$ essere stato a lungo in ballottaggio tra i due concorrenti].
'I disapprove of the attribution of the prize$_i$ to Mary
[after PRO$_i$ being long at stake between the two candidates].'

b. A proposito del premio, disapprovo la **sua**$_i$ attribuzione a Maria
[dopo PRO$_i$ essere stato a lungo in ballottaggio tra i due concorrenti].
'Speaking of the prize, I disapprove of its$_i$ attribution to Mary
[after PRO$_i$ being long at stake between the two candidates].'

Binding of anaphors, as discussed earlier in connection with (409), suggests the presence of a null subject in (412a). The decisive piece of evidence for this assumption comes from the interference of control with binding. Once a

passivized object is raised to the subject position in order to control, it preempts the projection of PRO, and binding consequently fails (412b).[50] It seems impossible to explain this effect on a view where binding and control target implicit argument slots which need not be expressed syntactically.

(412) a. [PRO$_i$ l'attribuzione del premio a se stessa$_i$] ha fatto di Maria un tipico rappresentante della corruzione odierna.
'The attribution of the prize to herself made Mary into a typical representative of today's corruption.'

b. * A proposito del premio, la **sua**$_i$ attribuzione a se stessa [dopo PRO$_i$ essere stato a lungo in ballottaggio tra i due concorrenti] ha fatto di Maria un tipico rapresentante della corruzione odierna.
'Speaking of the prize, its$_i$ attribution to herself [after PRO$_i$ being long at stake between the two candidates] made Mary into a typical representative of today's corruption.'

### 5.6.2 *Control* into *DP: PRO or* pro*?*

Having established the existence of a syntactic null subject in nominalizations that lack an overt one, we turn to the question of its identity. Specifically, is

[50] I am simplifying Giorgi and Longobardi's account here. In fact, they claim that Romance DPs provide *two* "external" positions, one for the thematic subject and another one for possessors. Crucially, though, only the former counts as an A-position for binding and control, hence the clash in (412b).

An earlier version of this argument was presented in Roeper 1987.

(i) The destruction of the city [PRO to prove a point].
(ii) * The city's destruction [PRO to prove a point].
(iii) The review of the book [PRO to prove a point].
(iv) * The book's review [PRO to prove a point].

Roeper argued that implicit control is unavailable here because the agent θ-role of the verbs *destroy*/*review* is too low structurally to c-command the (PRO in the) rationale clause. On the other hand, a PRO subject (of DP) can be projected in (i)/(iii) and control into the rationale clause. The failure of control in (ii)/(iv) is due to the fact that the theme fills up the position for PRO. Hence, we have an indirect argument for PRO in DP.

The problem with this argument is that control into rationale clauses is not a syntactic phenomenon (and does not pattern with OC in general), hence is an unreliable probe into syntactic structure (see discussion of (440) in Section 6.1). The failure of control in (ii)/(iv) may well be a result of the fact that "passive nominals" do not induce an event interpretation (Grimshaw 1990), and the dependence of rationale clauses on this interpretation; in this sense, it is no more surprising than the failure of control with argument-less nominals (v), which are also restricted to "result" readings. Note that nothing occupies the position for PRO in (v).

(v) * The destruction [PRO to prove a point].

Nevertheless, Giorgi and Longobardi show that the counterparts of (ii)/(iv) in Italian (with pronominal possessors) are grammatical, a fact they attribute to the availability of two external positions in DP, possessor and subject; if the possessor is not required to participate in any A-relation, a subject PRO can still be projected (and control the rationale clause). The crosslinguistic (dis)similarities of rationale clauses should be studied in greater depth before any of the competing accounts is adopted.

it more like the null subject of controlled clauses (PRO) or the null subject of uncontrolled finite clauses (*pro*)? It turns out that the answer is not straightforward. The element in [Spec,DP] (or [Spec,NP]) displays mixed properties.

One argument for the PRO analysis and against the *pro* analysis is based on interpretive parallels with NOC in clauses (Giorgi and Longobardi 1991: 179–180). As we will see in Section 7.3, long-distance control differs from pronominal dependencies in being constrained by logophoricity: the antecedent of PRO must be a logophoric center (i.e., a person whose mental perspective is assumed, involved, reported, etc.). This explains why possessors cannot control out of the possessee DP if it is a logophoric center itself (413a) (cf. (489) below). Precisely the same restriction obtains when the controllee is a null subject of a nominalization (413b), indicating that the latter is a logophor (namely, NOC PRO) and not a pronoun (namely, *pro*).

(413) a. [PRO$_i$ conoscere se stesso] è stato molto utile
to.know himself has been very useful
alla carriera/*madre di Mario$_i$.
to.the career/*mother of Mario
'To know himself has been very useful to Mario's career/*mother.'

b. [PRO$_i$ la conoscenza di se stesso] è stata molto utile
knowledge of himself has been very useful
alla carriera/*madre di Mario$_i$.
to.the career/*mother of Mario
'The knowledge of himself has been very useful to Mario's career/*mother.'

Bewilderingly, opposite facts were reported for English in Sichel 2010. (414a) shows that logophoricity is at work in NOC of PRO in (gerundive) clauses, but (414b) shows that the null subject of nominalizations is free to pick an antecedent inside a logophoric center (unlike the situation with gerundive complements, see (418) below). This is evidence for *pro* in the specifier of *refusal*, not PRO (note that this *pro* further controls a PRO in the complement of the noun).

(414) a. * John's$_i$ aunt knew that [[PRO$_i$ shaving himself] was crucial for success].
b. [John's$_i$ mother]$_j$ was committed to [the *pro*$_{i/j}$ refusal [PRO to jeopardize himself/herself]].

The contrast between the Italian (413b) and the English (414b) is an open question for future research.

A fundamental descriptive question is whether the null subject of nominalizations ever displays the strict referential dependence that OC PRO does. It turns out that the answer is not straightforward; sometimes it does, sometimes it does not.

In his detailed study of control into nominals in Catalan, Spanish and Italian, Alba-Salas (2006) distinguishes four types of verbs according to the type of control they induce (OC or NOC) and the type of complement they select (clause or DP). The verbs in (415a–415b) allow either a clausal or a nominal complement; those in (415c–415d) only select nominal complements. Below I illustrate only the case of interest, involving nominal complements. All the examples are taken from Catalan, and the PRO-notation is mine.

(415) a. Verbs inducing OC in both clausal and nominal complements
(*començar* 'begin', *acabar* 'finish', *provar* 'try', *dedicar-se* 'dedicate oneself to', etc.)
L'Eva$_i$ es dedica a [PRO$_{i/*j/*arb}$ la falsificació de passaports].
the.Eva REF devotes to the forgery of passports
'Eva forges passports (for a living).'

b. Verbs inducing OC in their clausal complement and NOC in their nominal complement
(*prometre* 'promise', *recordar-se* 'remember', *voler* 'want', *esperar* 'hope', etc.)
L'Eva$_i$ ens va prometre [PRO$_{i/j/arb}$ una investigació de l'escàndol
the.Eva to.us PST promise an investigation of the.scandal
(per part del govern$_j$)].
by part of.the government
'Eva promised us an investigation of the scandal (by the government).'

c. Light verbs inducing OC in their nominal complement
(*fer* 'make', *efectuar* 'do', *donar* 'give', *exercir* 'exert', *realitzar* 'carry out', etc.)
La Mònica (li) farà [PRO$_{i/*j/*arb}$ una trucada (*del Pere)
the Monica (to.her) will.make a call (of.the Pere)
a l'Eva].
to the.Eva
'Monica will give Eva a call (*by/from Pere).'

d. Verbs inducing NOC in their nominal complement
(*descriure* 'describe', *criticar* 'criticize', *esmentar* 'mention', *queixar-se* 'complain', etc.)
El Pau esmentà [PRO$_{i/j/arb}$ una inversió de
the Paul mentioned an investment of
300 euros (de/per part de l'Ali$_j$)].
300 Euros of/by part of the.Ali
'Paul mentioned a 300 Euros investment (by Ali).'

Class (415a) is the least problematic; whatever one's story for OC into clausal complements is can be extended to nominal ones, to capture their parallel behavior. The fact that class (415d) displays NOC in nominal complements, then, strongly suggests that the treatment of control into nominals cannot be wholly uniform. At least for the verbs in (415d), the null subject in the nominal

complement cannot be OC PRO; hence, it is either NOC PRO or *pro*. Harder questions are raised by (415b–415c). One common treatment of light verb constructions "fuses" the argument structure of the nominal complement and the bleached argument structure of the light verb, creating one complex predicate (e.g., Grimshaw and Mester 1988, Hale and Keyser 1993). On this account, the nominal complement of the verbs in (415c), much like infinitival restructuring complements in Romance and Germanic, does not contain a PRO since it does not project a structural subject.

Alba-Salas' own account is framed within the conceptual-structure (CS) theory of control developed in Jackendoff and Culicover 2003 (see Section 5.1.1). In this theory, OC is primarily tied to action complements; control predicates whose underlying CS representation harbors an action complement designate a certain co-argument of the action (an intender, an obligated party, an addressee, etc.) as the controller. As discussed in Section 5.1.1, the main problem with this approach is that the extension of OC and the extension of action complements are significantly distinct: An action complement may escape OC (in Jackendoff and Culicover's sense of the term), and more commonly, many OC complements do not denote actions.

Indeed, Alba-Salas shows that while some of the verbs in (415a) (e.g., *acabar* 'finish') select action complements, clausal or nominal, others (e.g., *começar* 'begin') may take state-denoting complements. The latter, Alba-Salas claims, are "lexically marked" for control. As for the puzzle in (415b) – the same verb induces OC into a clause and NOC into a nominal – Alba-Salas posits a lexical ambiguity; e.g., *prometre* 'promise' selects either an action infinitive, or a theme DP object. Only the former is associated with OC via the CS system of "argument binding."[51]

This account is not only stipulative, but probably too narrow. The clause-DP contrast runs deeper than the action-state contrast, such that the former cannot be reduced to the latter. Giorgi and Longobardi (1991: 183–184) note minimal pairs with verbs like *volere* 'want' and *amare* 'love', which *always* allow non-action complements, whether clausal or nominal. Nonetheless, only the latter type permits NOC (diagnosed below by *se stessi* 'oneself').

(416) a. Socrate$_i$ voleva/amava anzitutto conoscere se stesso/*se stessi.
Socrates wanted/loved mainly to.know himself/*oneself
'Socrates mainly wanted/loved to know himself/*oneself.'

[51] Culicover and Jackendoff (2001) cite (i) as evidence for control into the noun complement of *promise* (the promiser is the kisser). However, this is a pragmatic effect at best, easily manipulated by context and lexical choices, as (ii)–(iii) show.

i. John promised Mary some sort of messy kiss.
ii. John promised Mary some sort of messy kiss by Bill.
iii. John promised Mary the best doctor's treatment.

b. Socrate$_i$ voleva/amava anzitutto la conoscenza di se stesso/se stessi.
Socrates wanted/loved mainly the knowledge of himself/oneself
'Socrates mainly wanted/loved the knowledge of himself/oneself.'

Such contrasts reveal that there is an irreducible syntactic ingredient to control which is not captured by purely semantic approaches. Nevertheless, empirical typologies such as (415) are extremely valuable for future research on the various determinants of control into nominals.

A recent attempt at a uniform analysis is presented by Sichel (2010), who argues that the null subject in nominalizations is always *pro*. Sichel points out that the interpretation of the null subject is heavily influenced by the semantics of the matrix predicate (see also Engelhardt 1999). Some predicates (like *commit*, *doubt*, *deny* etc.) are neutral, giving the illusion of NOC in (414b). Others, like *put off*, *opt for*, *maintain and stick to* favor coreference with the matrix subject (417a); whereas predicates like *criticize*, *agree*, *share* and *disapprove* favor disjoint reference (417b). With all these verbs, the above interpretations are merely preferences that can be overridden in marked pragmatic circumstances, in sharp contrast to OC in clauses, which may never select a DP-internal possessor as controller on the basis of pragmatics.

(417) a. [John's$_i$ mother]$_j$ maintained/opted for [the *pro*$_{j/*i}$ refusal [PRO to jeopardize herself/*himself]].
b. [John's$_i$ mother]$_j$ criticized/disapproved of [the *pro*$_{i/*j}$ refusal [PRO to jeopardize himself/*herself]].

Notice that in all these examples there *is* one OC relation – namely, the one between the implicit subject of the nominalization and PRO in the infinitive inside it (more on this point in the next section). The illusion of NOC, in some of the cases, is an artifact of the variable interpretation of the implicit subject of the nominalization itself. In this respect nominalizations are different from clausal complements. (418), with a gerundive complement, minimally contrasts with (414b) in disallowing the non-c-commanding antecedent, precisely because the subject of the gerund is an OC PRO (Sichel 2010).[52]

(418) [John's$_i$ mother]$_j$ was committed to [PRO$_{j/*i}$ refusing [PRO to jeopardize herself/*himself]].

Sichel's account conflicts with Alba Salas' both on the empirical level and on the theoretical one. The key question is whether the *pro* analysis is true not only for the verbs in (415b, 415d) but also for those in (415a, 415c), and if so, what accounts for the OC effect in the latter (which does not seem to be pragmatically defeasible)? Conversely, a uniform PRO analysis would

[52] See also (i)–(ii) (from Culicover and Jackendoff 2001: fn. 12).

i. John resisted attempting to shoot himself$_i$/*him$_i$.
ii. John resisted attempts to shoot him$_i$/*himself$_i$.

have to explain the clause/DP asymmetry: why is the alleged PRO subject of certain DP complements allowed to escape OC, unlike the PRO subject of clausal complement? A plausible suggestion, yet to be refined, was raised in connection with examples (106)–(109) in Section 1.6: the DP layer is a barrier to OC from the outside. Any "OC-like" effect is, in fact, lexically induced and not mediated by PRO.

There are further challenges to the *pro* analysis, independently of the facts in (413) and (415a, 415c). From a typological perspective, it is unclear how *pro* is licensed in non-*pro*-drop languages. Further, the asymmetry is systematic: far more languages have PRO rather than *pro* subjects. Whatever the right statement of the *pro*-drop parameter is, there is no explanation for why it displays different settings in clauses and DPs in English-type languages.

A final, independent empirical challenge to the *pro* analysis is the fact that nominalizations pattern with control clauses in providing a "gate" to salvage WCO violations, as noted in Higginbotham 1980 (see fn. 39 and Giorgi and Longobardi 1991: 263, fn. 4).

(419) a. Who$_i$ did (??his$_i$) devoting his life to his country inspire?
b. Who$_i$ did (??his$_i$) devotion to his$_i$ country inspire?
c. Knowing his$_i$ limitations would help every linguist$_i$.
d. Knowledge of his$_i$ limitations would help every linguist$_i$.

Although the ultimate explanation of PRO-gate still eludes us (see Section 5.5), one thing is certain: the effect is tied to PRO. Like standard pronouns, *pro* does *not* cancel the WCO violations in parallel environments (see (368), (369b)).

Thus, the final verdict on the identity of the null subject in DPs – and on whether a uniform analysis is even feasible – is still open. In certain environments, and under certain tests, the null subject patterns with PRO, whereas in other environments, and under other tests, it patterns with *pro* (or possibly with NOC PRO).

### 5.6.3 *Control* inside *DP*

In this section we turn to consider control relations that are established entirely within the DP projection. We focus on infinitival complements, which are controlled by some argument of the head noun (adjunct control inside DPs is also possible, see (411)–(412)).

Not surprisingly, one finds a systematic parallelism between the choice of controller in clauses and in DPs.

(420) a. [$_{CP}$ John$_i$ vowed to Mary [PRO$_i$ to restrain himself/*herself]].
b. [$_{DP}$ John's$_i$ vow to Mary [PRO$_i$ to restrain himself/*herself]].
c. [$_{CP}$ John appealed to Mary$_i$ [PRO$_i$ to restrain herself/*himself]].
d. [$_{DP}$ John's appeal to Mary$_i$ [PRO$_i$ to restrain herself/*himself]].

Data of this kind suggest that the same OC mechanism is at work in clauses and in DPs. Indeed, this has been the standard view since the 1970s. Recall the OC signature ((74) above).

(421) *The OC signature*
In a control construction [ . . . $X_i$ . . . [$_S$ $PRO_i$ . . . ] . . . ], where X controls the PRO subject of the clause S:
a. The controller(s) X must be (a) co-dependent(s) of S.
b. PRO (or part of it) must be interpreted as a bound variable.

For complement control, (421a) ensures that the controller and the controlled clause are co-arguments. This is indeed true of control inside nominals. For example, the appearance of long-distance and arbitrary control in (422a) is an illusion; the controller is the implicit addressee of the noun *appeal*, which may take on various interpretations depending on context. Once the addressee is expressed, no other control option is possible (422b) (but see fn. 53 below).

(422) a. $Mary_i$ said that [$_{DP}$ the appeal [$PRO_i$ to make herself/oneself at home]] was a pleasant surprise.
b. $Mary_i$ said that [$_{DP}$ the appeal to $Jerry_j$ [$PRO_{j/*i/*arb}$ to make himself/*herself/*oneself at home]] was a pleasant surprise.

A further effect of (421a) can be seen in ellipsis contexts, where the elided PRO only accepts a sloppy reading (local control), not a strict reading (long-distance control). Consider (423), from Sichel 2010.

(423) a. John's attempt to sneak into the party was not as clever as Bill's.
[sloppy only: Bill is the attempted sneaker]
b. John's claim to have signed the petition was just as reliable as Bill's.
[sloppy only: Bill is the claimed signer]

(421b) can be observed in the interpretation of *only*-DP phrases acting as controllers (cf. (78)). Since such DPs do not sit comfortably inside English nominalizations, I illustrate with Hebrew. The controller *rak me-Gil* 'only from Gil' in (424a) supports a sloppy reading (424b) but not a strict one (424c).

(424) a. ha-bakaša rak me-Gil le'hitnacel eynena hogenet.
the-request only from-Gil to.apologize not fair
'The request only of Gil to apologize isn't fair.'
b. √ Sloppy reading: Gil = only x [x is requested that x apologize]
c. * Strict reading: Gil = only x [x is requested that Gil apologize]

Although it is the mainstream view, the idea that OC applies inside nominals has been occasionally challenged by authors who advocated a NOC analysis (Williams 1980, Hornstein 2003 and Boeckx and Hornstein 2003). Let us take a look at the arguments offered.

Williams' reasons for classifying control inside nominals as NOC were the possibility of arbitrary control (425a), non c-commanding controllers (425b), lexical subject instead of PRO (425c) and control shift (the controller is *us* in (425d), *John* in (425e)).

(425) a. any attempt to leave.
b. the attempt by $\text{John}_i$ [$\text{PRO}_i$ to leave].
c. John left [orders [for Bill not to leave]].
d. John left $\text{us}_i$ orders [$\text{PRO}_i$ to follow Pete].
e. $\text{John}_i$ left orders [$\text{PRO}_i$ not to be disturbed].

None of these facts, however, is at conflict with modern conceptions of OC, and in particular, with the OC signature as stated in (421). (425a) is OC by a generic null subject; the attempter and the leaver must co-vary. (425b) is no more problematic than other cases of OC by a dative or oblique PP (e.g., *He appealed [to* $\text{her}_i$*] [*$\text{PRO}_i$ *to behave herself/*himself/*oneself]*). (425c) is not a reliable NOC diagnostic, but rather a language-particular peculiarity of *for*-infinitives; (425d–425e) respect the locality of OC on the assumption that the true controller is an implicit argument of the nominal *orders* – the addressee in (425d), the agent in (425e). The latter case does illustrate the interesting interaction between passivization in the infinitive and control shift (see Section 5.1.2 for discussion), but again, control shift is fully consistent with OC.

Independent concerns about the status of control inside nominals are raised by Hornstein 2003 (and repeated in Boeckx and Hornstein 2003). First, Hornstein cites examples of split and partial control inside nominals. However, given that these types of control pattern with ordinary OC, and indeed, satisfy (421), they do not seem reliable indicators of NOC (see Sections 5.2–5.3). Next, Hornstein claims, contra (423), that strict readings *are* possible under ellipsis.

(426) John's attempt to sneak himself into the party was not as clever as Bill's.

Notice that (426) minimally differs from (423) in containing the object anaphor *himself*. As Sichel (2010: fn. 8) observes, this anaphor introduces a confound, since it can be construed strictly, due to "vehicle change" (Fiengo and May 1994). Crucially, though, the reading so obtained is "mixed," implying that Bill attempted to sneak John. The sneaker *must* be interpreted as the local attempter, *Bill*, namely, sloppily.

Finally, Hornstein points out that possessors may be related to their head noun in a variety of ways, not only as agents of events. In a situation where John is backing (rather than planning) a plan in which he gets hidden by being buried in a pit, (427) is felicitous; note that condition B forces PRO to be disjoint from the possessor.

(427) [$\text{John's}_i$ plan [$\text{PRO}_{j\neq i}$ to bury $\text{him}_i$ in the pit]] just won't work.

This interesting example would appear to challenge the claim that control inside nominals mimics control in clauses. However, a closer look reveals where the crucial difference lies.

The special interpretation of (427) depends, as Hornstein observes, on John *not* being construed as the thematic agent of *plan*. Why? It seems that *plan* is ambiguous between the event/process reading and the result reading. As is well known, only the former reading involves a full argument structure that parallels the verb *plan* (Grimshaw 1990); indeed, on the VP-within-NP analysis of derived nominalization, this asymmetry is inevitable.

In other words, the non-agent reading of *John* in (427) guarantees that the head noun, *plan*, is not an event noun. As a consequence, it does not project any arguments. In particular, the infinitive *[to bury him in the pit]* is also not a thematic argument of *plan* (exactly what it is is an interesting question, though not directly relevant). Thus, we have two non-arguments within the nominalization – *John* and the infinitive – that are somehow related. The point is that this relation need not be OC; it is not clear that non-arguments *ever* exercise OC.

The upshot of this argument is that control inside derived nominals mimics OC in clauses *as long as the nominal concerned denotes an (argument-taking) event*. Granting this qualification, Hornstein's claim that control inside nominals, *in general*, is a species of NOC, is not warranted.[53]

Two pieces of evidence support this interpretation of the facts. First, the non-control reading of (427) is lost with a derived gerund, precisely because the possessor here must be interpreted as the thematic agent (gerunds only supporting the event reading).

(428) * [John's$_i$ planning [PRO to bury him$_i$ in the pit]] just won't work.

Second, a language that morphologically distinguishes the event and the result readings of *plan* would allow NOC in the latter but not in the former. This prediction is borne out in Hebrew, with the nouns *toxnit* 'plan' (result) and *tixnun* 'plan' (event) (note that the latter is a genuine noun, Hebrew lacking gerunds).

[53] Similar remarks apply to object control inside nominals; consider the following examples from Boeckx, Hornstein and Nunes 2010b: 224.

i. * Bill ordered Fred [PRO to ready ourselves for departure].
ii. Bill's order to Fred [PRO to ready ourselves for departure].

If *Fred* is understood as the person being ordered, object control is necessary. This is the unique interpretation of (i). The PP *to Fred* in (ii), however, admits a pure recipient reading: Fred received an order pertaining to somebody else. On that reading (and *only* on that reading), object control is merely optional. Note that the "recipient" reading depends on the order being understood as an abstract theme being transferred from the agent; i.e., on the result reading of *order*.

(429) a. ha-toxnit šel $\text{Gil}_i$ [$\text{PRO}_{j\neq i}$ likbor $\text{oto}_i$ ba-bor] pašut lo ta'avod.
the-plan of Gil to.bury him in.the-pit just not will.work
'Gil's$_i$ $\text{plan}_{\text{RESULT}}$ to bury him$_i$ in the pit just won't work.'

b. * ha-tixnun šel $\text{Gil}_i$ [PRO likbor $\text{oto}_i$ ba-bor] pašut lo ya'avod.
the-plan of Gil to.bury him in.the-pit just not will.work
'Gil's$_i$ $\text{plan}_{\text{EVENT}}$ to bury him$_i$ in the pit just won't work.'

We may conclude OC applies inside derived nominalizations, on their event reading, just as it does in clauses.

At this point one may wonder: why bother study control inside DPs, if it can teach us nothing beyond what we already know from control in clauses? The answer is that nominalizations and clauses are indeed quite similar as far as their argument structure is concerned, but quite different at the level of surface structure. While arguments of verbs have fixed positions and often resist omission, arguments of nouns have flexible positions and are always omissible. Thus, nominalizations do provide a potentially useful probe into a fundamental question: at what grammatical level is OC established?

Consider paradigm (225) from Section 5.1.1 (due to Sag and Pollard (1991)), repeated below.

(430) a. Sandy's promise to Tracy to leave the party early caused quite an uproar.
b. The promise by Sandy to leave the party early caused quite an uproar.
c. The promise that Sandy made, to leave the party early, caused quite an uproar.
d. The promise to leave the party early, which Kim knew would be immediately forthcoming from Sandy, was going to cause quite an uproar.
e. A: Sandy made Tracy a promise.
B: What was it?
A: I think it was to leave the party early.

Sag and Pollard's point is that the controller in (430a–430e) (the person to leave the party early) cannot be identified by syntactic criteria, since it is located in various positions within the nominalizations, or even, as in (430e), outside the sentence containing the infinitive. Still, in all these cases the choice of controller is invariant: it is the person making the promise, namely Sandy. This means that control cannot be a syntactic relation and must be stated over argument structures. This argument, essentially unchanged, is replicated in Culicover and Jackendoff 2001 and Jackendoff and Culicover 2003, only they take the proper locus of control to be conceptual structure.

However, the argument is inconclusive. As discussed in Section 5.1.1, data like (430) do show that the *choice* of controller is governed by semantic factors. But this is not equivalent to saying that the very control dependency is not registered in the syntax. On a modular view of grammar, OC could be

established in the syntax between PRO and any suitably local controller; which of the potential controllers yields a licit interpretation and which does not is decided in the semantics, outside syntax.

The question is whether underlying the various realizations of the control dependencies in (430) is there a constant configuration. In fact, it is not hard to see that a subject PRO in [Spec,DP] of *promise* – the same PRO that was motivated in the preceding section – could be the controller of the PRO subject of *to leave*. This promiser PRO may be suppressed as an implicit agent in the passive nominal in (430b), to avoid a condition C violation with the *by*-phrase; implicit controllers, however, are arguably syntactic too (Landau 2010b). (430c) may not even contain PRO inside the nominal, "control" being achieved by the light verb complex predicate *make a promise*, as in (415c). Standard reconstruction in relative clauses (*Sandy made the promise . . .*) guarantees that this predicate applies to *Sandy*.

In (430d) *Sandy* is a long-distance "cataphoric" controller of PRO in the *promise*-nominalization (on cataphoric control, see Section 7.2). While the promiser is necessarily the leaver, notice that the choice of *Sandy* as promiser in this example is only pragmatically favored, not forced. And finally, the promiser PRO is linked to *Sandy* in the first sentence of (430e), thanks, once again, to OC in light verb constructions. This PRO is carried over inside the *promise*-DP to the second and third sentences, where this DP is anaphorically realized as *it*. The link to the PRO subject of *to leave* in the third sentence is supplied by connectivity in copular sentences, a grammatical mechanism quite independent of control.

All in all, each of the examples in (430) is consistent with a syntactically invariant control relation between the subject of *promise* and the subject of *to leave*. Standard grammatical processes, motivated independently, guarantee that the former (i.e., the promiser) is understood to be *Sandy* throughout.[54] While control inside nominals may hold important lessons for the theory

[54] Culicover and Jackendoff (2001) and Jackendoff and Culicover (2003) challenge the PRO hypothesis on the basis of nominals with overt determiners, echoing Williams' (1985) argument. However, as discussed in connection with (400) above, this argument is outdated, presupposing an impoverished NP projection that cannot host both PRO and some D/Q head. In fact, the occurrence of PRO *can* be preempted by argumental elements, not by determiners, as revealed in the subtle contrasts in (412).

Anticipating the idea of control by a DP-internal null pronoun or PRO in examples like (i)–(ii), Farrell (1993) argues that it falsely predicts condition C violations, as overt pronouns trigger in (iii)–(iv).

i. The promise that [[the candidate]$_i$ made] [PRO$_i$ to lower taxes] . . .
ii. An attempt [on [the president's]$_i$ part] [PRO$_i$ to convince the Senate to pass the bill] . . .
iii. * The promise from him$_i$ that [[the candidate]$_i$ made] . . .
iv. * His$_i$ attempt [on [the president's]$_i$ part] . . .

of control, its very existence does not invalidate syntax-oriented approaches to OC.

Before leaving the topic of control inside nominals, let us mention one last fact. In languages with rich case systems, case-concord can be used to detect the case on PRO (see Section 4.2 for discussion). Recall that Russian displays three patterns: case transmission (PRO inherits case from the controller), case independence (PRO and the controller bear distinct cases) and an alternation between these two options; see (201). Landau (2008) discovered that case transmission into nominals is "parasitic" on the control relation. Specifically, when PRO inside a noun complement is controlled by the matrix subject, its case is either independent (the preferred option, realized as dative in Russian) or inherited from the nominative subject; cf. (431a). In contrast, when PRO is not controlled by the matrix subject, case transmission is blocked and PRO must bear an independent dative case; cf. (431b).

(431) a. Ivan$_i$ polučil ukazanie [PRO$_i$ prijti odin/odnomu na
Ivan.**NOM** got instruction to.come alone.**NOM/DAT** to
večerinku].
party
'Ivan got an instruction to come alone to the party.'

b. Ivan$_i$ dal ukazanie [PRO$_j$ prijti odnim/*odni na
Ivan.**NOM** gave instruction to.come alone.PL.**DAT/*NOM** to
večerinku].
party
'Ivan gave an instruction to come alone to the party.'

The technical details of Landau's analysis of this pattern need not concern us here. The interesting question, from the perspective of the discussion in this section, is the status of the *actual* controller of PRO, which is the implicit addressee of *ukazanie* 'instruction'. It is doubtful that this element bears case, let alone nominative case. Hence, the emergence of nominative case on PRO in (431a) is somewhat mysterious; it could only have come from the matrix subject *Ivan*, which does not directly control PRO (remember that the default case for PRO in Russian is dative, not nominative). One could perhaps suggest that *polučil ukazanie* 'got instruction' undergoes re-analysis, thereby turning the dependency between *Ivan* and PRO into a direct OC relation. Being optional, re-analysis may be avoided, giving rise to dative case. In (431b), on the other

As to (i), I assume that, similarly to (430c), no PRO is needed in light verb constructions to achieve the control effect. As to (ii), a PRO subject is not undermined by (iv) since the latter is ruled out independently of condition C, cf. (v); the adjunct *on X's part* is simply incompatible with *any* overt argumental possessor. Note that condition B is not at stake in (v), as (vi) confirms.

v. * John's$_i$ attempt [on his$_{i/j}$ part] . . .
vi. John's$_i$ insistence [on his$_{i/j}$ role] . . .

hand, re-analysis of *dal ukazanie* 'gave instruction' will have no effect on case transmission, since the (semantically licit) OC relation is not established with *Ivan*.

*Further reading*

For relevant works on the topic of Section 5.6, see Williams 1985, Chomsky 1986, Giorgi and Longobardi 1991, Sag and Pollard 1991, Roeper 1987, 2000, Engelhardt 1999, Culicover and Jackendoff 2001, Longobardi 2001, Boeckx and Hornstein 2003, Alba-Salas 2006, Landau 2007, Sichel 2009, 2010.

# 6 Adjunct control

The title of this chapter might suggest that there is a coherent linguistic phenomenon of adjunct control; however, the content of this section will undermine this idea. Unlike complements, which form a well-defined class, adjuncts are myriad. They may bear any kind of semantic relation to the main clause and occur in several positions in the clause. Thus, one cannot talk about "adjunct control" in general, without prior analysis of the particular syntax and semantics of specific adjuncts.

Rather than carrying out this daunting project, I will try to distinguish between two broad categories: OC adjuncts and NOC adjuncts. Most of the properties of NOC adjuncts will be addressed in Chapter 7, whose topic is NOC in general. In this section I mainly focus on OC adjuncts and some cases of special interest whose status (OC or NOC) is not so clear.[1]

## 6.1 A quick survey of controlled adjuncts

The sample below illustrates a variety of OC adjuncts in English.

(432)
a. *Temporal gerund* (including *without*-clause).
Bill$_i$ called us [before/after/while/without PRO$_i$ visiting his aunt].
b. *Result clause*
Mary$_i$ grew up [PRO$_i$ to be a famous actress].
c. *Outcome/telic clause*
The ship$_i$ sank, [only PRO$_i$ to be dredged up again].
d. *Goal clause*
Max$_i$ works hard [PRO$_i$ to stay out of jail].
e. *Stimulus clause*
Mary$_i$ smiled [PRO$_i$ to think what a fool she had been].

[1] Quite a few studies classify adjuncts, and specifically initial adjuncts, under OC (Mohanan 1983, Lebeaux 1984, Borer 1985, 1989, Clark 1990, Hornstein 1999, 2003, Pires 2007). This unitary view is untenable, as the pragmatic aspects of control into some adjuncts has been extensively documented (Bresnan 1982, Williams 1992, Kawasaki 1993, Lyngfelt 1999, 2000, Landau 2000, 2001).

f. *Object purpose clause*
We bought Mary$_i$ the dog [PRO$_i$ to play with].

g. *Subject purpose clause*
She called a detective$_i$ [PRO$_i$ to investigate the affair].

The list is surely not exhaustive, and varies from one language to the other, sometimes in mysterious ways (e.g., in Swedish, *after* may take a control infinitive but *before* only takes a finite complement); see examples (192) for some English-internal peculiarities. Types (432b–432e) are little known and still pose intriguing semantic questions (Huettner 1989, Whelpton 2001). Types (432f–432g) are more widely studied and better understood (Faraci 1974, Chomsky 1980, Bach 1982, Nishigauchi 1984, Clark 1990, Jones 1991, Español-Echevarría 1998, Whelpton 2002).

One adjunct type that is missing from this list is a rationale clause. The control status of such clauses is controversial, as we will see below. Rationale clauses optionally include *in order*, do not allow object control and cannot contain an object gap. Purpose clauses cannot include *in order*, can be object controlled, and may include an object gap.

(433) a. We$_i$ bought Mary$_j$ the dog [(in order) PRO$_{i/*j}$ to play with it].
b. * We bought Mary$_j$ the dog [in order PRO$_j$ to play with].
c. * She called a detective$_i$ [in order PRO$_i$ to investigate the affair].

As shown at length in Faraci 1974 and Jones 1991, purpose clauses are VP-internal while rationale clauses are VP-external, possibly compatible with multiple attachment sites (Español-Echevarría 1998).

Huettner (1989) provides useful descriptions of the adjuncts in (432b–432e). Result clauses occur almost exclusively with unaccusative verbs; "the relationship between the main clause and the adjunct ranges from mere 'occasion' to natural causation: the infinitive expresses a non-intended sequel to the main clause action" (p. 26). In contrast, outcome clauses require an initial *only*, place no restriction on the main clause predicate and imply an unexpected (rather than natural or occasional) outcome.

(434) a. *Result clause resists* 'only'
The damp seeped in (?? only) to chill our bones.

b. *Result clause resists a matrix unergative verb*
?The harness jingled to make music.

c. *Outcome clause allows a matrix unergative verb*
Mary worked very hard, only to be passed over for promotion.

d. *Outcome clause resists 'expected' outcome*
??Mary worked very hard, only to finish the contract in time.

Goal clauses are similar to rationale clauses but quite distinct upon inspection: "the main clause describes a kind of (possibly abstract) motion towards

the goal expressed in the infinitive" (p. 40). They are incompatible with verbs that are not goal-oriented, and attach VP-internally. Rationale clauses are free of these restrictions.

(435) a. *Goal clause is VP-internal*
John went out to smoke / *What John did to smoke was go out.

b. *Goal clause requires a goal-oriented main verb*
* Mary hammered to hang the picture.[2]

c. *Rationale clause is VP-external*
What John did in order to smoke was go out.

d. *Rationale clause allows non goal-oriented main verb*
Mary hammered in order to hang the picture.

Stimulus clauses, according to Huettner, express the immediate cause, or stimulus of the main event. The adjunct's event must involve some perception and be involuntary. The clause is VP-internal.

(436) a. *Stimulus clause must involve an involuntary event*
Susan blushed to recall/*contemplate Bill's importunities.

b. *Stimulus clause must involve a perceptual event*
* Max wept to lose his boat in the storm.

c. *Stimulus clause is VP-internal*
* What Max did to see his livelihood swept away was weep.

The choice of controller with most adjuncts is straightforward: it must be the matrix subject. This is true of all the adjunct types in (432a–432e). Purpose clauses are different, so let us briefly consider them.

In object purpose clauses, the matrix theme is associated with an object gap in the infinitive; the standard analysis involves a null operator, bound by the matrix theme, that moves to the edge of the adjunct (Chomsky 1980, Browning 1987). The subject PRO is controlled by a goal or benefactive, if there is one, or, in their absence, by the agent. Note that the theme may be a subject of a copular sentence (Whelpton 2002).

(437) a. Carol bought Jim$_j$ a rack$_i$ [$_{CP}$ Op$_i$ [PRO$_j$ to hang coats on t$_i$]].
b. Carol$_j$ bought a rack$_i$ [$_{CP}$ Op$_i$ [PRO$_j$ to hang coats on t$_i$]].
c. The car$_i$ was in the showroom [$_{CP}$ Op$_i$ [for the crowds/PRO to see t$_i$]].

The semantic characterization of control in purpose clauses is roughly as follows (see Faraci 1974, Bach 1982, Nishigauchi 1984, Cutrer 1993). A theme is either present, created or transferred to the possession of somebody. The

[2] This sentence is only interpretable as a rationale clause without *in order* (as in (435d), i.e., the hammering and the hanging are not part of the same event, but somehow the former is required in order to bring about the latter.

ultimate "holder" of the theme controls PRO. Thus, the ultimate holder of the rack is *Jim* in (437a), but *Carol* in (437b). In (437c) it is whoever visits the showroom and thereby comes to "hold" the car (in some perceptual sense).

Because of the implication that the theme is to be used by the controller, verbs that do not imply a "positive" resultant state cannot be sensibly modified by purpose clauses (438a–438b). Pragmatics, however, may intervene to assign a positive resultant state even to negative verbs (438c) (Bach 1982, Cutrer 1993).

(438) a. * I read it to review.
b. I bought / *sold it to read.
c. John killed Mary a turkey to prepare for Thanksgiving.

Finally, as Bach and Nishigauchi observed, the goal/benefactive controller may be implicit.

(439) a. Here's *Bambi* to read to your children.
b. The university should provide a decent library to work in.

Bach observed that if the context makes available a salient antecedent for the implicit benefactive, it may override the overt agent as the chosen controller (cf. (438b), where the missing benefactive could be the controller).

Let us turn now to rationale clauses. There is an enormous amount of research on control in rationale clauses, especially in connection with implicit agents (Faraci 1974, Williams 1985, Jaeggli 1986, Roeper 1987, Lasnik 1988, Clark 1990, Jones 1991, Español-Echevarría 1998, Whelpton 2002); see Landau 2000: 179–183 for a useful survey. Below we summarize the main findings of this research.

Rationale clauses (RatC) in English may either contain a PRO subject or a lexical subject. The control properties of PRO in a RatC are quite intricate. The two most popular views are: (i) PRO is controlled by the matrix agent (explicit or implicit) (cf. Roeper 1987); (ii) PRO is controlled by the matrix event/state as a whole (cf. Williams 1985). Consider the following array of facts (culled from the sources above).

(440) a. The boat was sunk to collect the insurance.
b. * The boat sank to collect the insurance.
c. * The ship sank (in order) for the owner to collect the insurance.
d. Grass is green to promote photosynthesis.
e. Flamingoes are pink to attract the opposite sex.
f. The boat sank in order to impress the queen and move her to murder her husband by the end of act III.
g. The house was emptied (in order) to be demolished.
h. * The ship was sunk to become a hero.
i. * The ship was sunk [PRO to be promoted].
j. The fines were paid (in order) to avoid further complications.
k. * Marijuana was smoked to become illegal in the 1930s.

The contrast between (440a) and (440b) is standardly taken to indicate the necessary involvement of a matrix agent in RatC control: since a passive verb retains the agent role (implicitly) but an unaccusative verb does not, PRO is properly controlled in (440a) but not in (440b) (Manzini 1983).

The argument is untenable. First, as (440c) (where control is not at stake) shows, the problem in (440b) is independent of control. Unaccusative verbs typically denote events that are conceptually at conflict with the characteristic semantics of a RatC. Under this semantics, the matrix event must be construable as a product of some intentional causation or teleological design. This is further corroborated in (440d–440e), which involve no matrix agent. (440f) demonstrates that even the unaccusative *sink* may occur in a context that makes a RatC felicitous. The final nail in the coffin of the "agent-control" theory are sentences like (440g), where the matrix patient (a derived subject) rather than the agent controls PRO.

The event-control theory fares no better. Its initial motivation was to capture cases like (440d, 440e), which defied agent-control. Lasnik (1988) cited (440h, 440i) to argue that implicit agent control is not only unnecessary but even impossible (otherwise, the implicit sinker should have been able to control the "becomer" or the person to be promoted). However, this leaves unexplained examples like (440a, 440j), where the embedded predicate clearly selects an animate PRO (i.e., events cannot collect insurance or avoid complications); it also overgenerates (440k), as Clark (1990) observed, where the embedded predicate is perfectly compatible with the matrix event as a subject (marijuana becoming illegal), yet control fails.

Landau (2000: 183) concludes that there is no adequate theory of RatC control to date. Because the procedure of controller choice in RatC is not well understood, it is not entirely clear whether the construction falls under OC or NOC. Currently, the evidence seems to lean towards the NOC side. A generalization of some value is the following: the controller of RatC is either the matrix subject or the intentional causer of the matrix event/state. "Intentional causer" is a broader notion than grammatical agent, applying also in cases like (440d–440f) to pick an extra-sentential controller. Cases (440h, 440i, 440k) remain problematic: it seems that embedded passive/unaccusative verbs are incompatible with control by the intentional causer, although, crucially, they do allow control by the derived subject (440g). The latter example indicates that RatC control cannot be fully reduced to semantics – the intentional causer is not always the controller.

## 6.2 The mechanism of adjunct OC: predication

We now return to the theoretical issue of how to explain OC in those adjuncts that display it.

The adjunct clauses in (432) possess the OC signature, as shown in Section 1.2: the controller must be an argument of the clause immediately dominating the adjunct (usually, but not always, a subject); long-distance, discourse and arbitrary control are ruled out. Furthermore, under ellipsis and the *only*-test, only sloppy readings emerge.

Not all the OC adjuncts in (432) enjoy positional freedom; in fact, only temporal and absolutive clauses may occur sentence-initially. As noted in Williams 1992 and Kawasaki 1993, there is a strong correlation between an adjunct's position and its control status. For the most part, final adjuncts display OC and initial adjuncts display NOC. Nevertheless, these are only tendencies. In the next chapter we will see that final adjuncts may tolerate NOC if set off by a comma from the main clause. Conversely, initial adjuncts may also display OC, as the following examples suggest (Kawasaki 1993: 31, 118).

(441) a. [After $PRO_i$ snowing a lot in February], $it_i$ never rains heavily in March in this area.
b. [After $PRO_i$ causing a lot of trouble], the $dishwasher_i$ finally broke down.
c. [After $PRO_i$ falling into this liquid], sugar never dissolves.

One may wonder – how do we know that these are cases of OC and not NOC, where PRO is optionally coindexed with the matrix subject? The answer is that these cannot be NOC examples since PRO in NOC is necessarily [+human] (see Chapter 7).

The semantic contribution of each type of adjunct merits an independent investigation. For present concerns, however, we may abstract away from these differences and ask: how does the OC phenomenon come about in adjunct clauses? It seems that the best theory in this domain is the predication theory (Clark 1990, Williams 1992).

On the predicational approach (see Section 2.1), the nonfinite clause functions as a predicate and the controller serves to saturate it. In Clark's implementation, PRO is a λ-operator that moves to the embedded [Spec,CP] position, turning the adjunct into a derived predicate (442a). In Williams' implementation, there is no PRO; the operator is an index on unsaturated maximal projections, transferred upwards under immediate dominance, until it is assigned to a sister NP – the controller (442b).

(442) a. $John_i$ laughed $[_{PP}$ after $[_{CP}$ $Op_i$ $[_{IP}$ $t_i$ seeing himself in the mirror]]].
b. $John_i$ $[$laughed $[_{PP}$ after $[_{VP}$ seeing himself in the mirror$]_i]_i]_i$.

The basic predication mechanism is the same, whether one posits a PRO subject or not.[3] The question is what evidence there is for a predicational analysis.

[3] Sections 3.2 and 5.4 present much evidence that control clauses contain a PRO subject.

On a purely descriptive level, notice that adjunct clauses sometimes alternate with bare predicates, closely related in meaning.

(443) a. Mary took a nap [at her parents' home].
b. Mary took a nap [while being at her parents' home].
c. Mary slipped in [unnoticed].
d. Mary slipped in [without being noticed].

Of course, one can imagine that the relation between *Mary* and the bracketed phrase in (443a, 443c) is fundamentally different from the relation in (443b, 443d); this would declare the striking semantic parallelism a mere coincidence. Notice also that there is no independent reason to assume a PRO subject inside the predicates in (443a, 443c) (*pace* Hornstein and Lightfoot 1987); direct predication is all that is needed.[4] The question then is which theory of OC is neutral enough on the issue of PRO so as to account for the analogous (443b, 443d) without thereby also positing an unmotivated PRO in (443a, 443c). The only answer seems to be – the predicational theory.

A further analogy between predication and adjunct OC is mentioned in Landau 2007. Recall from Section 5.2 that tensed OC complements (i.e., complements whose tense is distinct from that of the matrix clause) allow partial control.

(444) a. $\text{Fred}_i$ preferred [$\text{PRO}_{i+}$ to meet after lunch].
b. Sam told me that $\text{he}_i$ was looking forward to [$\text{PRO}_{i+}$ working together].

Despite the fact that they clearly bear their own independent tense, temporal adjuncts do not accept partial control.

(445) a. * $\text{John}_i$ called up before [$\text{PRO}_{i+}$ meeting in the restaurant].
b. * Sam told me that $\text{he}_i$ would retire [after $\text{PRO}_{i+}$ working together].

If OC in adjuncts is not achieved the way it is in complements, but rather through predication, the contrast is understood. For (445) would be no more surprising than (446): a predicate that is directly predicated of a singular subject cannot be semantically plural.[5]

[4] Baltin (1995) cites (i) as evidence for an internal PRO in the initial predicate adjunct (since the reciprocal needs a local binder). In fact, the binder here could be the lower subject, under reconstruction, if the predicate has been fronted from the embedded clause. This is strongly suggested by the fact that an intervening island obliterates the binding possibility (ii). Thus, not only is there no positive evidence for PRO in predicate adjuncts, there is evidence *against* it; an internal PRO should have saved (ii) from violating condition A.

(i) Angry with each other, I don't think that we can succeed.
(ii) * Angry with each other, I hated the job in which it was possible that we could succeed.

[5] Adler (2006: 83), noting examples parallel to (445), proposes an explanation within the Agree theory of control (Landau 2000). The gerundive adjuncts are either bare TPs or DPs directly

(446) * John called Mary together / as a team / extremely polarized.

A final piece of evidence for the predicational analysis of adjunct OC concerns the visibility of implicit arguments qua controllers. Section 5.4 has established that such arguments are perfectly legitimate as controllers of complements. The situation with adjuncts is more complex.

(447) a. The game was played wearing no shoes.
b. The president was elected without considering his competence.

Although it seems that the matrix implicit agent controls the adjunct in such examples (taken from Roeper 1987), it turns out that special restrictions apply to these passive sentences that do *not* apply to their active counterparts. We return to this issue in Section 7.4, so presently I just cite the main finding (which is due to Manzini 1986). Consider the following pair.

(448) a. The rain washed the stairs [before PRO entering the basement].
b. The stairs were washed [before PRO entering the basement].

Not all speakers accept (448b), but those that do, must interpret the enterer (PRO in the adjunct) as a person, and not as the rain; this is so despite the fact that implicit external arguments in English passives need not be human (e.g., *The stairs were washed by the rain*). What this implies is that the [+human] specification in (448b) is intrinsic to PRO, which in turn suggests that it is the NOC type of PRO, not the OC one, which is indifferent to the feature [±human], as (448a) confirms.

The question then is: why can the implicit external argument not exercise OC into the adjunct? This is another restriction that sets adjunct OC apart from complement OC. And once again, the predicational analysis provides a straightforward answer. As is well-known, implicit arguments in general cannot saturate predicates (see Section 5.4).

(449) a. * The door was approached nervous.
b. * The stairs were washed tired.

Thus, we see that the predicational analysis ties together a number of properties of adjunct OC that would be otherwise unrelated.[6]

embedding TPs; in either case, no CP layer is projected, hence there is no goal for the Agree relation that could generate partial control. This proposal faces two difficulties: (i) how can Agree penetrate an adjunct for the purposes of control but not for the purposes of extraction (adjuncts being islands)?; (ii) in most languages, OC adjuncts are infinitives, categorially indistinguishable from OC complements (i.e., projecting a CP layer), yet the ban on partial control appears to be universal.

[6] It is standard to assume that arguments and their predicates must c-command each other. Examples (441a–441c) appear to be problematic if we assume that the subject in [Spec,TP] does not c-command a TP-adjunct. This assumption may be wrong, however; alternatively, the initial

*Further reading*

For relevant works on the topic of Chapter 6, see Faraci 1974, Bach 1982, Mohanan 1983, Nishigauchi 1984, Williams 1985, 1992, 1994, Borer 1985, Manzini 1986, Jaeggli 1986, Roeper 1987, Lasnik 1988, Farkas 1988, Huettner 1989, Clark 1990, Jones 1991, Kawasaki 1993, Español-Echevarría 1998, Lyngfelt 1999, 2000, Landau 2000, 2003, Whelpton 2001, 2002, Adler 2006.

adjuncts in these examples might be preposed from a TP-internal position that *is* c-commanded by the subject (under reconstruction).

The possibility of implicit control in (439) raises some doubts that predication is the mechanism underlying control in object purpose clauses. Indeed, these clauses must be predicates of the matrix *theme* (to saturate the object gap), so it is hard to see how they could simultaneously be predicates of the controller. Semantics aside, there is only one [Spec,CP], so there cannot be more than a single λ-operator per clause.

# 7 Non-obligatory control

Most of this book was concerned with the different aspects of OC: structure, interpretation and crosslinguistic variation. In this final chapter we turn to NOC. We will see that NOC is a phenomenon quite different from OC. So different, that they are probably handled in distinct modules of the grammar. While the first generative study of NOC (Grinder 1970) proclaimed that OC and NOC are governed by the same principles, this position was immediately questioned and challenged (Kimball 1971, Neubauer 1972).[1] Subsequent work has accepted the dichotomy and tended to focus on either OC or NOC. Grossly speaking, while OC is of a kind with strictly grammatical processes (be they predication, binding or movement), NOC is of a kind with pragmatic phenomena, chiefly logophoric reference and topicality.

The discussion of NOC will proceeds as follows. Section 7.1 describes the distribution of NOC clauses and presents the "NOC signature," parallel to (and a mirror image of) the OC signature. Section 7.2 discusses the various attempts in the 1970s and 1980s to define and formalize the complex locality constraints on NOC – concluding that they have all ultimately failed. Sections 7.3 and 7.4 turn away from syntax to the two salient pragmatic determinants of NOC – logophoricity and topicality. Finally, Section 7.5 attempts to pull all the strings together and develop a competition-based, multi-dimensional view of NOC.

## 7.1 The NOC signature

I begin by describing the distribution of NOC clauses, and then turn to their characteristic interpretation. By distribution I mean the location of the clause within the larger syntactic context. Factors internal to the clause, such as tense and agreement specifications, are not considered here (see Section 4.1). In other

[1] The first analyses of control assumed deletion of the controlled subject. OC was Equi-NP Deletion and long-distance control was Super-Equi-NP Deletion. The latter could operate across more than one clause boundary, but in Grinder's analysis, was subject to the same intervention constraint that constrained the former. We return to these issues in Section 7.2. On the "eliminative" attempts to reduce all NOC to implicit OC, and why they failed, see Section 5.4.

words, we only look at clauses that are internally capable of hosting PRO; in English, this amounts to infinitives and gerunds.[2]

Recall that we have already established one key distributional distinction between OC and NOC clauses, namely (96) in Section 1.4, repeated below.

(450) *Configurational effects on control*
Complement clauses fall under OC; subject and adjoined (extraposed) clauses fall under NOC.

This generalization is very robust. As discussed in Section 1.4, there are only two well-defined classes of exceptions to it. First, if an extraposed clause is a co-argument of an experiencer DP, that DP is an obligatory controller. Second, subject clauses selected by evaluative adjectives (the *rude-of* class) and *easy*-adjectives (*difficult*, *hard*, *tough*) must also be controlled by their co-argument DP.

Beyond argumental clauses, adjunct clauses may also display NOC. The situation with adjuncts, however, is more complex, as already mentioned in Chapter 6. The control status of an adjunct clause is affected both by the type and the position of the adjunct. Certain adjunct clauses always display OC; typically, these are event-related adjuncts, such as result, goal, exchange and stimulus clauses (see (432)). These adjuncts are adjoined to VP and resist fronting. In contrast, there is a class of higher, TP-adjoined adjuncts, including temporal and absolutive clauses. These adjuncts may appear either sentence-finally or initially. While the final position strongly favors OC (although NOC is possible, provided the adjunct is set off with a pause), the initial position is quite tolerant to NOC.

A variety of NOC examples in English is presented below.[3] Note that the controller of PRO is rather free in these examples, corresponding to one or two long-distance antecedents, a discourse participant, or some arbitrary referent. Below we examine these interpretive options more closely.

(451) *NOC in English*
a. *Subject clause (Super-Equi)*
John$_i$ finally realized that [PRO$_{i+j}$ hurting each other] really bothered Sue$_j$.

[2] There is a curious scholarly asymmetry between the extensive crosslinguistic research on OC and the virtual absence of careful analyses of NOC outside English (and possibly Swedish). The reader may recall how crosslinguistic evidence caused dramatic shifts in the theory of OC. It may well be the case that future research on NOC outside English will produce findings with comparable dramatic effects on the theory of NOC. Currently, in the absence of such research, present assertions about NOC deserve more skepticism than assertions about OC.

[3] There is considerable amount of variability in judgments. Not all English speakers accept all NOC examples in this section, but each example is acceptable to some speakers.

b. *Subject clause (discourse control)*
Clearly, [PRO confessing my crime] was not something they anticipated.

c. *Extraposed clause*
I never understood why it is bad for health [$PRO_{arb}$ to stuff oneself with marshmallows].

d. *Initial temporal adjunct*
[After PRO pitching the tents], darkness fell quickly.

e. *Final temporal adjunct*
Potatoes are tastier [after PRO boiling them].[4]

f. *Final "without"-clause*
There will be no progress [without PRO investing economic and human resources].

g. *Initial absolutive clause*
$I_i$ can assure you that [$PRO_i$ having read through every single page in these secret files], the government is lying.

Let us ask now what is common to all NOC constructions. In other words, what is the NOC signature. For comparison, recall the OC signature.

(452) *The OC signature*
In a control construction [ . . . $X_i$ . . . [$_S$ $PRO_i$ . . . ] . . . ], where X controls the PRO subject of the clause S:
a. The controller(s) X must be (a) co-dependent(s) of S.
b. PRO (or part of it) must be interpreted as a bound variable.

Quite simply, NOC constructions do not obey these restrictions. Thus, the NOC signature can be defined negatively.

(453) *The NOC signature*
In a control construction [ . . . [$_S$ PRO . . . ] . . . ]:
a. The controller need not be a grammatical element or a co-dependent of S.
b. PRO need not be interpreted as a bound variable (i.e., it may be a free variable).
c. PRO is [+human].

The examples in (451) already establish point (453a). Another way of demonstrating it is by VP-ellipsis. While OC PRO contained in an ellipsis site only admits a sloppy reading, NOC PRO allows a strict reading as well, since its controller is not confined to the clause containing the infinitive or gerund.[5]

[4] Note that this sentence (from Ackema and Schoorlemmer 1995) does not necessarily imply that the boilers are the tasters; thus, this case of NOC cannot be reduced to implicit OC.

[5] This was first observed, to my knowledge, by Nishigauchi 1984 and Bouchard 1985. Their examples, however, as Wyngaerd (1994: 189) pointed out, were confounded by the presence of a local implicit controller (see (i)); thus the strict readings revealed the pronominal nature of that controller and not the nature of PRO in NOC. Example (454b) is free of this problem.

i. John thinks that it will be difficult ___$_i$ [$PRO_i$ to feed himself], and Bill does too.

(454) a. John$_i$ tried [PRO$_i$ to leave early],
and Bill$_j$ did too ~~try [PRO$_{j/*i}$ to leave early]~~.

b. John$_i$ thinks that [PRO$_i$ behaving himself] will please his mother,
and she$_j$ does too ~~think that [PRO$_i$ behaving himself] will please her~~.

A related contrast is observable in the interpretation of *it*-anaphora. Chierchia and Jacobson (1986) argued that whenever a Super-Equi clause is controlled long-distance, it denotes a proposition, unlike OC clauses, which denote properties. Thus, while the *it*-anaphora test yields an obligatory sloppy reading in OC contexts (455a) (see Section 2.1), it allows either a sloppy or strict reading in Super-Equi contexts.[6]

(455) a. *OC* (only sloppy *it*)
Ed liked playing poker. But John didn't like *it*.
[Only: John didn't like John's playing poker]

b. *NOC* (sloppy or strict *it*)
Sue thought that playing poker would bother Bill,
but Mary thought that *it* wouldn't.
[Mary thought that Mary's playing poker wouldn't bother Bill; OR
Mary thought that Sue's playing poker wouldn't bother Bill]

While the propositional status of Super-Equi clauses seems uncontroversial, Chierchia and Jacobson's theoretical treatment of long-distance control is contested. In essence, they analyze long-distance control as an instance of unbounded variable binding, on a par with dislocation and question formation. Criticizing their proposal, Richardson (1986) points out that it leaves unexplained conspicuous disanalogies between Super-Equi and standard cases of unbounded variable binding, such as: the "binder" (controller) in Super-Equi need not appear in a designated structural position (unlike *wh*-operators); it may be split (cf. (451a)); and the control relation ignores standard islands – applying most commonly into subject clauses, from which movement is blocked (see also Chomsky 1981: 57). Even more problematic is Chierchia and Jacobson's prediction that discourse control into subject clauses would be ruled out (since the subject gap would be left unbound); see examples (451b).

To illustrate point (453b), consider the following pair.

(456) a. *OC (only sloppy reading)*
[Only Bill]$_i$ expects [PRO$_i$ to recite *The Tiger*].

b. *NOC (sloppy or strict reading)*
[Only Bill]$_i$ expected that [[PRO$_i$ reciting *The Tiger*] would impress Jane].

[6] Arbitrary or discourse control is also possible in (455b). Chierchia and Jacobson actually claim that sloppy readings should be unavailable in Super-Equi. Richardson (1986) disputes this claim on empirical grounds, citing examples where the context favors either a sloppy or a strict reading. Furthermore, he suggests that the propositional analysis does not obviously preclude a sloppy reading in (455b).

(456a) asserts that Bill is the only person X who entertained the expectation that X would recite *The Tiger*. In contrast, (456b) is ambiguous. On the sloppy reading it asserts that Bill is the only person X who entertained the expectation that X's reciting *The Tiger* would impress Mary. On the strict reading it asserts that Bill is the only person who entertained the expectation that Bill's reciting *The Tiger* would impress Mary. Thus, if both Bill and Peter, and only them, expected that Bill's reciting *The Tiger* would impress Mary, the sloppy reading of (456b) is true but the strict reading is false.

Finally, note that the *de se* reading is optional in NOC, specifically in Super-Equi (where this can be tested). This, in itself, should not be taken as part of the NOC signature since, as shown in Section 1.2 (examples (86)–(88)), *de se* is similarly optional in complement and adjunct OC.

For the following examples, consider the context where John's computer has been hacked, and some secret files have been copied from it by a business competitor. John's company holds an urgent meeting to decide on the necessary measures. John has no idea that his own computer was the one that was hacked, but he is determined to punish any careless workers who failed to protect their computers against malicious attacks. In that scenario, (457a) is false but (457b) may be true.

(457) a. $\text{John}_i$ insists on [$\text{PRO}_i$ being punished]. only *de se* – False
b. $\text{John}_i$ insists that [$\text{PRO}_i$ being punished] will prevent similar hacks in the future. *de se* – False; *de re* – True

The final notable characteristic of NOC, (453c), concerns the reference of PRO. As often observed, NOC PRO must be [+human]. This property is commonly associated with arbitrary control, i.e., with $\text{PRO}_{\text{arb}}$, but in fact, as we will see below, it extends to long-distance control too. The [+human] feature of NOC PRO seems to be universal. This is interesting and not trivial, since languages do differ in their choice of *formal* features specified on $\text{PRO}_{\text{arb}}$ (e.g., 3sg in Spanish, 3pl in Italian).

Observe first that OC PRO is different. This is barely detectable in complement OC, where the controller is almost always selected to be [+human]. Since PRO must match the controller in all features, it too comes to be [+human]. Crucially, though, this is not an intrinsic feature of OC PRO. The rare OC contexts allowing a [–human] controller bring this out.

(458) a. Suddenly she forced the $\text{car}_i$ [$\text{PRO}_i$ to stop].
b. Your $\text{alibi}_i$ fails [$\text{PRO}_i$ to convince me].
c. The jet $\text{pipe}_i$ serves [$\text{PRO}_i$ to convert pressure energy of the fluid into the kinetic energy of a jet].

Moreover, OC adjuncts freely allow inanimate PRO.

(459) a. This book$_i$ was out of print [before PRO$_i$ becoming a bestseller last summer].
b. Granola snacks$_i$ can raise your energy level [without PRO$_i$ increasing your blood pressure].
c. The crops$_i$ are harvested [only PRO$_i$ to rot in the barns].

Turning to NOC PRO, to be convinced that it is *intrinsically* [+human], we must guarantee that it does not inherit this feature from some implicit controller (e.g., as argued in Wyngaerd 1994: 151). We should also make sure that this feature is not s-selected by the predicate in the nonfinite clause. The relevant examples were first presented in Chomsky 1981: 324–327.[7]

(460) a. It is possible [PRO$_{arb}$ to roll down the hill].
cf. It is possible [for the rocks to roll down the hill].
b. * [PRO to snow all day] would be a nuisance.
cf. For it to snow all day would be a nuisance.
c. * [PRO to be clear [that we're out of fuel]] would be a nuisance.
cf. [For it to be clear [that we're out of fuel]] would be a nuisance.

Uncontrolled PRO cannot be interpreted as [–human], pleonastic *it* of weather predicates or the pure expletive *it* of extraposition. Chomsky noted that this semantic restriction is more severe than the restriction on the value of a *wh*-variable, which simply has to be a member of the mental domain D of individuals, human or not.

(461) a. What$_i$ t$_i$ rolled down the hill?
b. * What$_i$ t$_i$ snowed?

While inanimate referents are genuine arguments, weather *it* is only a "quasi-argument," not a member of D.

Interestingly, OC PRO is somewhat freer in its referential character, accepting quasi-argument controllers. Examples like (462a) were given by Postal (1974: 161, fn. 56), who attributes them to Kayne. Postal dismissed the possibility that coreference can hold of weather *it*, but Chomsky (1981: 324–327) suggested that quasi-arguments do participate in control. Still, expletive control is not

[7] As discussed in Section 3.2, sentences like (460c) constitute a strong argument for the syntactic presence of PRO.
Jaeggli and Safir (1989) observe that expletive PRO is ruled out in Spanish and German too, proposing a universal ban on such an element. But if uncontrolled PRO must be [+human] anyway, the absence of expletive PRO would be derivative (see also Ackema 2002).

i. * Es posible agradarle que María esté enferma.
is possible to.please.him that Maria be sick

ii. * Es ist möglich ihn zu gefallen, dass Maria sei krank.
it is possible him to please that Maria be sick
'It is possible to please him that Maria is sick.'

allowed, e.g., when *there* is the controller (462b) (also attributed to Kayne in Postal 1974: 35, fn. 3).

(462) a. Around here, $it_i$ always snows before [$PRO_i$ raining].
b. $There_i$ can't be peace [without there/*$PRO_i$ being war first].

This can be seen with degree clauses as well (see also Baltin 1995).

(463) a. The $noise_i$ was loud enough [$PRO_i$ to disturb the neighbors].
b. There was enough noise [*(for there) to be any useful discussion].

The status of *it*-control is essentially the same. Brody (1984) cites the contrast in (464a–464b) as evidence that an "unassociated" *it* cannot control.

(464) a. $It_i$ is clear [without $PRO_i$/it being obvious] [that Mary left yesterday]$_i$.
b. $It_i$ is clear [that Mary left yesterday]$_i$ without [it/*$PRO_i$ being obvious [that she was forced to]$_j$].

The explanation reduces to the θ-criterion, according to Brody. The controller of PRO in (464a) is really an argument, the extraposed clause; *it* merely acts as a "relay," which in fact is absent without extraposition: *[That Mary left yesterday]$_i$ was clear [without $PRO_i$ being obvious]*. Thus, PRO is argumental. The problem in (464b), then, is that the single θ-role of *obvious* must be discharged to two distinct arguments, PRO and the embedded extraposed clause. Note, though, that the argument simply presupposes that controlled PRO cannot be a pure expletive; the very operation of OC in (464) forces PRO to become an argument.[8]

Returning to NOC PRO, further evidence for its intrinsic [+human] feature is given below. (465), from Williams 1992, involves a NOC adjunct.

(465) * The $window_i$ proves that [before $PRO_i$ breaking], it was raining.

(466a–466c), from Kawasaki 1993: 30, involve a NOC adjunct and gerundive NOC complements to V and P (see Section 1.6). Kawasaki observed that despite the fact that the linguistic context favors an inanimate referent for $PRO_{arb}$, the only available interpretations involve a (pragmatically odd) [+human] referent.

(466) a. [After $PRO_{arb}$ being spoiled in a refrigerator], there is nothing even a good cook can do.
b. The government abolished [$PRO_{arb}$ having to be surrounded by fences].
c. I read stories about [$PRO_{arb}$ falling off a cliff].

[8] An example from Williams 1994: 91 casts some doubt on this conclusion.

(i) $It_i$ can seem that someone is guilty [without $PRO_i$ seeming that they actually committed the crime].

Whether such examples are particular to *seeming* or not is unclear.

If indeed a [+human] interpretation is a necessary feature of NOC PRO, its absence can be used to argue against the presence of PRO. Kawasaki (1993: 75) noted that the missing subjects of infinitives in identity and definitional sentences may refer to inanimate entities, citing example (467a). Following Dowty 1985, she suggested that such infinitives need not project a PRO subject, hence they denote unsaturated properties. This may well extend to necessity sentences, whose main predicate expresses a logical entailment (*entail*, *require*, *involve*); note the possibility of [–human] subjects in (467b).

(467) a. To be crystallized means to come to have a certain molecular structure.
b. To be red entails to be colored.

The PRO-less analysis of such sentences provides a straightforward explanation for the "linked reading" effect – the coreference between the two missing subjects (Lebeaux 1984). Co-extensive properties are nothing but co-extensive sets of individuals possessing these properties.

(468) a. Making a large profit requires exploiting the tenants.
b. Becoming a movie star entails being recognized by everyone.

Lebeaux proposed that the infinitives in these sentences do contain PROs, which are co-bound by an unselective generic operator. He further claimed that linked readings obey a locality constraint, but Kawasaki (1993: 59–71) provided counterevidence to this claim.

If linked readings depend on an entailment/identity relation between two properties, rather than two propositions, predicates that do not carry this entailment should allow the missing subjects to be non-coreferent. As Lebeaux (1984: fn. 6) noted, the missing subjects in the following example indeed need not co-vary.

(469) Going to the movies beats staying home and eating popcorn.

Thus, verbs like *beat* do not counterexemplify the general rule that imposes OC on complement clauses (*pace* Jackendoff and Culicover 2003); on the assumption that the subjectless complement of *beat* is a bare VP, there is no PRO to control.

## 7.2 Distance effects and intervention: the failure of structural constraints

The first study of NOC within generative grammar is Grinder 1970. Grinder's main contribution was to focus attention on the complex structural conditions on NOC. Although his results were challenged and revised in subsequent years, they offer a useful starting point to the discussion. We summarize them below.

First, terminology. In analogy to Equi-NP Deletion, the ancestor of OC, which applied between adjacent clauses, Grinder introduced Super Equi-NP Deletion, which could apply long-distance. For expository reasons, I will present Grinder's findings under the modern terminology of control and PRO. The problem Grinder addressed was identifying interveners on the "deletion path"; this will be restated as interveners for NOC.

That NOC applies long distance is easy to confirm (all the examples below are from Grinder 1970, modulo the PRO-notation).

(470) $\text{Sam}_i$ claimed that it was clear that it had turned out that it seemed likely that it would be impossible [$\text{PRO}_i$ to prepare himself for the exam in time].

If, however, the sentence contains other potential antecedents for PRO (i.e., non-expletive DPs), they may block long-distance control. Two primacy relations are relevant: command and precedence ($\alpha$ *commands* $\beta$ iff the minimal S dominating $\alpha$ dominates $\beta$). Grinder's intervention constraint can be stated as follows.

(471) *Grinder's intervention constraint*
C may control PRO iff C commands PRO and there is no intervener B.
B is an intervener that blocks control of PRO by C iff B commands PRO, and:
a. B precedes PRO and C follows it ( . . . B . . . PRO . . . C . . . )
b. OR, both B,C precede/follow PRO, B is closer to PRO than C, and B, C are not clausemates ( . . . C [$_S$ . . . B . . . PRO . . . / . . . PRO . . . B [$_S$ . . . C . . . ).

Consider first allowable NOC configurations.

(472) a. $\text{John}_i$ said that [$\text{PRO}_i$ making a fool of himself in public] disturbed Sue.
b. John said that it disturbed $\text{Sue}_j$ [$\text{PRO}_j$ to make a fool of herself in public]

In (472a), *Sue* does not intervene for *John*. Clause (471b) is irrelevant, as the two NPs lie on opposite sides of PRO. Clause (471a) does not hold, since the controller *John* precedes PRO. In (472b), *John* does not intervene for *Sue*. Clause (471a) is irrelevant, since *John* and *Sue* lie on the same side of PRO. Clause (471b) does not hold since *John* is not closer to PRO than *Sue*.

Non-commanding NPs cannot intervene, even if they linearly lie between the controller and PRO.

(473) a. The $\text{girl}_i$ [$_S$ who $\text{Max}_j$ loved] said that it would be difficult [$\text{PRO}_{i/*j}$ to excuse herself/*himself from the party before midnight].
b. [That [$\text{PRO}_i$ washing herself] was likely [$_S$ to disturb Pete]] irritated $\text{Eileen}_i$.

The minimal clause dominating *Max* and *Pete* is S, which does not dominate PRO. Hence, the lack of intervention for *the girl* and *Eileen*.

Consider next intervention by (471a).

(474) * [That it disturbed Pete [PRO$_i$ to wash herself]] surprised Eileen.

Both *Pete* and *Eileen* command PRO, but *Pete* also precedes it, thus counting as an intervener by (471a). Unfortunately, this condition is too strong, failing to distinguish (474) from other sentences Grinder discusses, where intervention is not observed.

(475) John said that [PRO$_i$ making a fool of herself in public] disturbed Sue$_i$.

(475) alternates with (472a), showing that a preceding-and-commanding NP need not always block control by a commanding-only NP. We can explain this gap in Grinder's system by noticing the different status of *Pete* in (474) and *John* in (475). While the former is an experiencer co-argument of the controlled clause, the latter is not a co-argument of that clause. As discussed in Section 1.4, this makes *Pete* an OC controller in (474), which cannot be skipped (Landau 2001).

Clause (471b) excludes examples (476a, 476b, 476d).

(476) a. * John$_i$ said that it disturbed Sue [PRO$_i$ to make a fool of himself in public].

b. * Eric$_i$ said that Roxanne knew that it would be difficult [PRO$_i$ to criticize himself].

c. Tom$_i$ told Harriet$_j$ that it would be tough [PRO$_{i/j}$ to prevent himself/herself from crying at the wedding].

d. * [That [PRO$_i$ washing herself with liquid oxygen] disturbed Pete] surprised Eileen$_i$.

In (476a–476b), both the attempted controller and the intervener command and precede PRO; because the intervener (*Sue* in (476a), *Roxanne* in (476b)) is closer to PRO, long-distance control by *John*/*Eric* fails. The effect is suspended if the two NPs are clausemates, as in (476c), where either NP may control. In (476d), both the attempted controller and the intervener command and follow PRO; again, because the intervener *Pete* is closer to PRO than *Eileen*, the latter cannot control.

Grinder's broader concern was to show that Super-Equi and standard Equi can be collapsed into one rule, which also constrains *picture*-NP reflexivization. The latter insight was crucial to launch the logophoricity approach, as we will see below; however, the project of unifying OC and NOC was doomed to fail. Indeed, if the constraints on Super-Equi were so strict, the project may have succeeded. However, subsequent work has challenged Grinder's

empirical generalizations, and in particular, indicated that NOC is freer than he imagined.[9]

First, Jacobson and Neubauer (1976) note that (476b), where the intervener is not a co-argument of the infinitive, are fine for some speakers. Indeed, grammatical examples are cited in the literature (Lebeaux 1984, Nishigauchi 1984).

(477) a. John$_i$ thought that Mary said that [PRO$_i$ shaving himself] would not be difficult. (Lebeaux 1984)

b. Mary$_i$ thought that John said that [PRO$_i$ shaving herself] would bother Sue. (Chierchia and Jacobson 1986)

Chierchia and Jacobson (1986: fn. 6) note that long-distance control in such examples is merely disfavored (due to "perceptual" factors), not strictly forbidden as it is in (476a).

Nor is intervention on the right side (476d) an absolute constraint, as Clements (1975), Kuno (1975) and Chierchia and Jacobson (1986) observed.

(478) a. [That [PRO$_i$ exiling himself] might grieve the Queen] never occurred to the minister$_i$. (Clements 1975)

b. [[That PRO$_i$ losing the race] would upset everyone so much] surprised Sam$_i$. (Chierchia and Jacobson 1986)

Third, as already noted, even extraposition as in (476a) not always produces intervention. Specifically, when the co-argument of the infinitive is not an experiencer, long-distance or arbitrary control may ignore it. Such examples were noted in several sources (the generalization was first formulated in Landau 2000).[10]

(479) a. The general$_i$ didn't agree that it would be good for the country [PRO$_i$ to remove himself from office]. (Clements 1975)

b. It would help Bill [PRO$_{arb}$ to behave oneself in public]. (Manzini 1983)

c. It is dangerous for babies [PRO$_{arb}$ to smoke around them]. (Kawasaki 1993)

[9] In Section 5.4 we have already discussed Kimball's (1971) critique, which boils down to the observation that many of Grinder's examples involve local implicit control. Thus, Grinder's intervention constraint can be seen as constraining potential antecedents for implicit controllers rather than PRO itself.

[10] The possibility of arbitrary control in the presence of a (semantically appropriate) potential local controller is problematic to many accounts, which treat control in terms of "search domains" (Lebeaux 1984, Chierchia and Jacobson 1986, Huang 1989, Sag and Pollard 1991, Manzini and Roussou 2000). The same problem arises in optimality-theoretic accounts (Lyngfelt 1999, 2000), which rank the presence of a controller below semantic appropriateness, so that "no controller" (=PRO$_{arb}$) can only surface if local control produces a semantic violation.

Fourth, perhaps most damaging to Grinder's view of NOC as a syntactic rule (reiterated in Postal 1974: 124) is the observation that NOC controllers need not command PRO. With enough context, NPs very low in the sentence can function as controllers.

(480) a. Contradicting himself will demonstrate that he is a liar.
b. Perjuring himself like that proves that Mr. Jones is an unreliable witness.
c. Storming out of the room that way after losing the game convinced everyone that John is very immature.
d. Washing his car regularly is just the sort of thing that shows how meticulous Bill is.

(480a) is from Bresnan 1982, (480b–480c) are from Richardson 1986, and (480d) is from Safir 1984. Note that PRO in the matrix clause subject is controlled by an NP in a lower clause; furthermore, a potential intervener (*everyone*) is ignored in (480c).

Actually, Bresnan (1982) did hold that NOC – in her terms, anaphoric control – is structurally constrained by "the f-command condition" (every f-structure that contains the controller must contain PRO too, where f-structure is the set of grammatical functions associated with a given predicate; see also Chierchia and Jacobson 1986 for a similar constraint). She cited (480a) with *Mr. Jones* instead of *he* as an ungrammatical example, presumably due to the f-command condition. The reason *he* is acceptable in (480a), Bresnan argued, is that the controller is directly picked from the discourse, the pronoun *he* simply being coindexed with it.[11] In response, Richardson cited examples (480b–480c), where a non-pronominal controller is acceptable although it fails to f-command PRO; the same holds for (480d) (see also Kawasaki 1993: 167 for discussion).

Examples in (480) also refute Lebeaux's locality condition on NOC. Lebeaux analyzed PRO in NOC as an Ā-anaphor, namely an anaphor that must be bound by a null operator (since A-binding fails, in the absence of a local controller). The null operator is adjoined to the matrix clause above the infinitive, and then picks an antecedent – either from discourse, or from the sentence (long-distance control) or no one in particular (arbitrary control).

(481) John thinks that [$Op_i$ [[$PRO_i$ helping himself/myself/oneself] is important]].

[11] Bresnan (1982) acknowledged that *unstressed* definite NPs can refer to discourse antecedents, thus circumventing the f-command condition on NOC. Although Bresnan treated PRO (in "anaphoric control") as a pronoun, she realized it is subject to stricter antecedence conditions than standard pronouns. Thus, the f-command condition was tied to the feature that distinguished PRO from overt pronouns – [+U] (= unexpressed). In the next section we will see that this feature is better viewed as [+logophoric].

Lebeaux noted that NOC controllers cannot occur arbitrarily low in the sentence, and in this regard, differ from normal antecedents of pronouns.

(482) [His$_i$/*PRO$_i$ having already shaved] shows that Mary arrived more than 3 minutes after John$_i$ did.

To rule out (482) with PRO, Lebeaux suggested that "the null operator may not c-command its antecedent." However, this formulation is way too strong. Not only does it rule out (480a–480c), it also excludes local control by a clausemate non-c-commanding NP (*[PRO$_i$ shaving himself] helped John$_i$*). We return to example (482) in the next subsection.

Boeckx and Hornstein (2007) (BH) develop a locality account of NOC on the basis of the movement theory of control (the MTC; see Sections 2.4 and 5.5), coupled with certain parsing strategies. Within the MTC, OC PRO is understood to be a trace of the controller, and NOC PRO is a "last-resort" *pro*, inserted whenever movement (of the controller DP) is blocked. BH assume that online parsing of incoming strings respects this grammatical principle; the parser prefers to drop a trace whenever possible (i.e., in non-island environments). A second parsing strategy, however, prefers to resolve the reference of gaps (null pronouns or traces) as early as possible; thus, once a gap is encountered (i.e., the syntactic environment "signals" its presence), the parser prefers to link it to one of the antecedents already parsed.

The two strategies collide in situations where there are two potential controllers for a PRO in a subject gerund, one in a higher clause and the other one clausemate to the gerund. The "trace over *pro*" strategy prefers to drop a trace and fix the local DP (namely, the second one) as a controller.[12] However, early antecedent resolution prefers to drop a *pro* and link it to the higher (first) DP (a trace is impossible, the gerund being an island). This conflict is left unresolved, and the grammar indeed may opt for either of these options.

(483) a. John believes that [[t$_i$ washing herself] would delight Mary$_i$].
b. John$_i$ believes that [[*pro*$_i$ washing himself] would delight Mary].

This account makes several predictions: (i) if both potential controllers precede the controlled gap and the closer one could have moved from the gap's position – long-distance control will be blocked, since the two parsing strategies converge on local control; (ii) if both potential controllers *follow* the controlled

[12] This is achieved via sideward movement from the subject position of the gerundive subject to the matrix object position; see the MTC's treatment of PRO-gate in Section 5.5. It is a theorem of the MTC that in the absence of preceding discourse, a subject gerund is obligatorily controlled by the matrix object, since there is no competition to the movement derivation. In fact, as Landau 2007 pointed out, such sentences display NOC characteristics; e.g., a strict reading is possible in (i) (*Bill's* flirting around didn't amuse his wife). See Landau 2007 for further tests.

i. Flirting around amused Bill, but not his wife.

gap and the closer one could have moved from the gap's position – long-distance control will again be blocked, for the same reason; (iii) if a potential controller precedes the controlled gap and could have moved from the gap's position, arbitrary control will be blocked (insertion of $pro_{arb}$ does not gain the parser); (iv) if a trace is not an option (i.e., sideward movement fails), the gap (which is *pro*) could take any antecedent that a pronoun can take.

None of these predictions is fulfilled, as the data documented above indicates. Scenario (i) does allow long-distance control in extraposition with non-psychological predicates (examples (99b), (479a), repeated below).

(484) a. $Mary_i$ thought that it helped $John_j$ [$PRO_{i/j}$ to speak $his_j$ / $her_i$ mind].
b. The $general_i$ didn't agree that it would be good for the country [$PRO_i$ to remove himself from office].

Scenario (ii) also allows control by the remote DP. This DP could be structurally higher than the local DP, as in (478a), repeated as (485a), or lower, as in (480c), repeated as (485b).[13]

(485) a. [That [$PRO_i$ exiling himself] might grieve the Queen] never occurred to the $minister_i$.
b. [$PRO_i$ storming out of the room that way after losing the game] convinced everyone that $John_i$ is very immature.

Scenario (iii) obtains in extraposition, as shown in (479b–479c), repeated below.

(486) a. It would help Bill [$PRO_{arb}$ to behave oneself in public].
b. It is dangerous for babies [$PRO_{arb}$ to smoke around them].

Finally, scenario (iv), in fact, reveals that NOC PRO is more restricted than a pronoun. This was partially illustrated in (473a), expanded as (487a), and in (482), repeated as (487b). Note that no DP in these examples occupies a legitimate landing site for sideward movement from the position of PRO. Hence, the parser can only opt for *pro*, and the discrepancy with overt pronouns stands out.

(487) a. The girl who $Max_i$ loved said that it would be difficult [for $him_i$/*$PRO_i$ to excuse himself from the party before midnight].
b. [$His_i$/*$PRO_i$ having already shaved] shows that Mary arrived more than 3 minutes after $John_i$ did.

Thus, even when supplemented with parsing components, purely structural analyses of NOC face serious empirical problems.

While crosslinguistic data on NOC is rather sparse, the little there is conforms to the English pattern. A study of Swedish corpus revealed that although local

[13] Note that by the time the remote DP is to move from inside the gerund in these examples, the latter is already a subject island.

antecedents (especially subjects) are preferred, specific contexts allow NOC to skip potential interveners – again, at some cost of unstable acceptability across speakers (see Rooryck's (2000) observations on English and French in this respect). Consider the following example from Lyngfelt 1999, 2000. In the first sentence, *Tiger Woods* is established as the discourse topic. The second sentence begins with a NOC adjunct. The controller of the adjunct is *Tiger Woods*, coreferential with the object of the second sentence, and not *ingen* 'no one', the subject of that sentence. This indicates the relevance of topicality to NOC, a point we return to in Section 7.4.

(488) **Tiger Woods**$_i$ var i praktiken borträknad från segerstriden, efter två "mänskliga" inledningsronder. Men [efter att PRO$_i$ igår ha tangerat banrekordet vågar], **ingen** räkna bort [**golfens nye "Golden Boy"**]$_i$.
'Tiger Woods$_i$ was in practice dismissed from the winning competition, after two "human" starting rounds. But [after PRO$_i$ having touched the record for the course yesterday], no one dares to disregard golf's new "Golden Boy"$_i$.'

Lyngfelt also notes that when the adjunct is placed sentence-finally, this reading is much harder to obtain, and subject control is favored. This replicates Williams' (1992) observation that initial adjuncts are significantly more accessible to NOC than final adjuncts, which strongly favor the subject-oriented OC reading.

While closer arguments need not intervene for more distant ones, they do generally intervene for DPs embedded *inside* them (see Chomsky 1981: 77–78, 1986: 125–131 for extensive discussion). This kind of intervention seems quite robust, as opposed to Grinder's cases.

(489) a. * John's$_i$ friends think it is illegal [PRO$_i$ to feed himself].
b. * [PRO$_i$ to have to feed himself] would annoy John's$_i$ friends. (Chomsky 1986: 125,128)
c. * [PRO$_i$ to find himself alone in Times Square] would frighten John's$_i$ Aunt. (Williams 1992)

Chomsky (1981: 77) suggested that "while PRO may have a non c-commanding antecedent, the latter may not be contained within an NP that is a possible controller." This is a good approximation of the restriction seen in (489), but further data, to which we turn in the next section, show it to be insufficient.

To summarize this subsection: Although it seems that closer and more prominent NPs are favored as controllers over more distant and less prominent ones, it proves very difficult to formalize a precise notion of intervention in NOC. Other than local experiencer co-arguments, that force OC, no other NP in the vicinity of a NOC clause can be said to be an absolute intervener. This state of affairs has led to a radically alternative approach to the question of intervention in NOC, based on the notion of logophoricity.

## 7.3 Logophoricity in NOC

Logophoric pronouns and reflexives pick their antecedent on the basis of some notion of mental perspective. A potential antecedent for a logophor must be one of the following: "the source of the report, the person with respect to whose consciousness (or 'self') the report is made, and the person from whose point of view the report is made" (Sells 1987: 445). In linguistic terms, logophoric antecedents are subjects and objects of mental verbs (*think*, *realize*), psychological predicates (*disturb*, *angry*) and communication verbs (*tell*, *hear*). The eventuality in which a logophor occurs must be construable as being perceived from the point of view of the antecedent (see Reuland 2006 for useful discussion).

The discovery that NOC PRO is exactly one such logophor was made by Kuno (1975). Kuno observed that no purely syntactic analysis can explain the following contrasts.

(490) a. John said to Mary that it would be easy to prepare herself for the exam.
b. * John said about Mary that it would be easy to prepare herself for the exam.
c. John sued Mary$_i$ for divorce because it was no longer possible to support her$_i$.
d. * John$_i$ sued Mary for divorce because it was no longer possible to support him$_i$.

The PRO subject of *to prepare* can be controlled by a goal of a communicative act (490a) but not by its subject matter (490b), whose perspective is not involved in the sentence. Similarly, the infinitive in (490c–490d) is embedded inside a reason adjunct expressing the perspective of the agent of *sue*, not its patient, hence the contrast. Furthermore, Kuno noted that *picture*-anaphors follow the same pattern; (491a–491b) are analogous to (490a–490b).

(491) a. John said to Mary that there was a picture of herself with a Mafia figure in the newspaper.
b. * John said about Mary that there was a picture of herself with a Mafia figure in the newspaper.

Thus, both *picture*-anaphors and NOC PRO (specifically, long-distance controlled PRO) are logophors. Grinder's observation, repeatedly documented in subsequent studies (Clements 1975, Jacobson and Neubauer 1976, Lebeaux 1984), that the distribution of PRO in Super-Equi mimics that of *picture*-anaphors, was fully explained.[14]

[14] Notice that there is a confound in (490b) that weakens Kuno's point. The PRO subject of *to prepare* is, in fact, obligatorily controlled by the implicit experiencer argument of *easy*, which is itself "anteceded" by *John* (see Section 5.4). What the example shows, then, is that the implicit

The following examples, from Williams 1992 and Landau 2000: 120, further illustrate the logophoric sensitivity of NOC PRO by minimally comparing experiencers (whose mental state and perspective are involved) with themes (whose mental state and perspective are not involved). As Williams points out, the logophoric center need not be grammatically represented, as long as its perspective is presupposed (in (493b), the arriver is the perceiver of the vision).

(492) a. [$PRO_i$ having just arrived in town], the main hotel seemed to $Bill_i$ to be the best place to stay.
b. [$PRO_i$ having just arrived in town], the main hotel was a vision indeed.
c. * [$PRO_i$ having just arrived in town], the main hotel collapsed on $Bill_i$.

(493) a. [$Him_i$/$PRO_i$ having been away for so long], nothing really matters to $John_i$.
b. [$Him_i$/*$PRO_i$ having been away for so long], nothing really bears on $John_i$.

Kuno's (1975) actual account of logophoricity effects relied on the "Direct Discourse" analysis.[15] In this analysis, verbs of communication or mental acts take deep structure complements whose subjects are first or second person pronouns. Thus, there is no Super-Equi rule that deletes one NP under identity with another; instead, there is a "logophoric" rule which deletes (underlying) first/second person pronouns.

To illustrate, Kuno derived the complement of (494a) from (494b) and that of (494c) from (494d). Since subject deletion in (494b) is grammatical, so is (494a), and since it is ungrammatical in (494d), so is (494c).

(494) a. John said that [washing himself in public would disturb Sue].
b. "(Me) washing myself in public would disturb Sue."
c. * John said that [it would disturb Sue to wash himself in public].
d. "It would disturb Sue *(for me) to wash myself in public."

In this analysis, Grinder's intervention effects are reduced to independent constraints on the deletion of first/second person pronouns. However, although the idea that "shifted" pronouns underlie the semantics of logophoricity is quite appealing, Kuno's implementation introduced a new mystery: why is subject

experiencer is a logophor of sorts, not that PRO itself is. Nevertheless, examples like (490d) and those to follow establish the same point for NOC PRO.

It is worth mentioning that *picture*-anaphors and NOC PRO are not *completely* parallel: Chomsky (1981: 73) observed that while intervening subjects can be skipped in NOC (as discussed in the previous section), they cannot be skipped in long-distance binding of *picture*-anaphors. Example (iv) is slightly changed from Chomsky's discussion to guard against the confound with implicit OC.

iii. $They_i$ thought that Bill said [that [$PRO_i$ feeding each other] would be unacceptable].
iv. * $They_i$ thought that Bill said [that [pictures of each $other_i$] would be on sale].

[15] The insight goes back to Postal 1970; see Section 5.1.

deletion of *for me* impossible in (494d)? This crucial fact did not follow from the direct discourse analysis (see Section 1.4 for a discussion of the OC status of experiencers in extraposition). Furthermore, as Ladusaw (1977) observed, Super-Equi is possible in clauses that are embedded under predicates like *deny* and *unaware*, which do not embed direct discourse complements.

(495) a. Clarence denied that tying himself in knots was difficult.
b. Prudence was unaware that it would be so easy to cut herself.

Thus, despite its superficial affinity to logophoricity, the direct discourse analysis cannot extend over the entire range of NOC constructions.

The logophoricity condition on NOC PRO explains most of the distributional curiosities documented in the previous section. It also explains why experiencers figure so commonly as NOC controllers; an experiencer argument is one whose mental perspective is necessarily invoked. The high frequency of experiencers in NOC configurations has led Wyngaerd (1994) to the extreme conclusion that NOC into subject clauses does not exist at all; rather, there is always an experiencer controller, overt or implicit, that exercises OC into the subject clause (by reconstruction, utilizing some special syntax of psych predicates, e.g., Belletti and Rizzi 1988). This position is untenable in view of cases where the experiencer is overt and distinct from PRO (e.g., (472a)), cases where no experiencer is selected by the matrix predicate (e.g., (466)), and cases where the controller is way too low for reconstruction to achieve a c-command relation between it and PRO (e.g., (480)). Thus, logophoricity, as a non-syntactic notion, is irreducible to the θ-theoretic notion of experiencer.

On the other hand, it is tempting to reduce the [+human] restriction on NOC PRO to the logophoricity condition (inanimate entities being unable to entertain a mental perspective), but this would be too hasty, as we show in Section 7.5.

Grinder's intervention effects (except for the case of a local experiencer controller (476a)) reflect the hierarchical embedding of mental perspectives in complex sentences. PRO in Super-Equi seeks an anchoring logophoric center, and favors the one in whose perspective it is immediately embedded over those to which it is only indirectly related. This is just a preference, however, as discussed in connection with (476b) and (477). Lebeaux's example (482) (with PRO), repeated as (496a), is explained, as *John* is not related to any predicate that implicates a mental perspective. Also explained is (496b), Chierchia and Jacobson's (1986) alleged counterexample to extrasentential control in Super-Equi. As Richardson (1986) noted, *courageous* does not establish a logophoric center; cf. (496c), where the psychological verb *feel* does precisely that.[16]

[16] Whether (496b) is strictly impossible is unclear; I am assuming here Chierchia and Jacobson's judgment. In the next section we will discuss the topic-sensitivity of NOC PRO, which should be able to license (496b).

(496) a. * [PRO$_i$ having already shaved] shows that Mary arrived more than 3 minutes after John$_i$ did.
b. * John$_i$ is courageous. But [PRO$_i$ getting himself arrested] still surprised Mary.
c. Tom$_i$ felt sheepish. [PRO$_i$ pinching those elephants was foolish]. He shouldn't have done it.

Finally, the logophoricity of NOC PRO explains a systematic class of exceptions to the blocking effect demonstrated in (489).

(497) a. * John's$_i$ friends think it is illegal [PRO$_i$ to feed himself].
b. * [PRO$_i$ to have to feed himself] would annoy John's$_i$ friends.
c. * [PRO$_i$ to find himself alone in Times Square] would frighten John's$_i$ Aunt.

A containing NP would *not* block control just in case it does not introduce a novel logophoric center. (498b–498c) are from Chomsky 1986: 128 and Williams 1992, respectively; the contrast in (498d), where *mother* does but *career* does not block control in Italian, is from Giorgi and Longobardi 1991: 179.

(498) a. John's$_i$ gratitude proved that it was important [PRO$_i$ to feed himself].
b. [PRO$_i$ to have to feed himself] would assist John's$_i$ development.
c. [PRO$_i$ to find himself alone in Times Square] became one of John's$_i$ most abiding fears.
d.

| | | | | | | |
|---|---|---|---|---|---|---|
| [PRO$_i$ | conoscere | se stesso] | è | stato | molt | utile |
| | to.know | himself | has | been | very | useful |
| alla | carriera/*madre | di | Mario$_i$. | | | |
| to.the | career/*mother | of | Mario | | | |

'To know himself has been very useful to Mario's career/*mother.'

Notice that blocking "internal" control whenever the containing NP is a potential controller itself (this is Chomsky's and Giorgi and Longobardi's view) is too strong, in view of (499), where *career*, although a semantically possible subject for *causing*, does not block control by *John*.

(499) [PRO$_i$ causing an uproar] is important for John's$_i$ career.

Rather, what we need is some characterization of "transparent nouns" that allow control from within. Landau (2000: 110) identified this class, pointing out that its members all denote abstract notions that reflect the individuality of the controller, via actions, character traits or social attributes.

(496c) illustrates so-called "free indirect discourse," which is a common narrative form of reporting a protagonist's thoughts using the third person. That free indirect discourse establishes a logophoric context is well known; see Sharvit 2008.

(500) *career*, *status*, *confidence*, *performance*, *development*, *image*, *reputation*, *behavior*, *success*, *fear*, *hope* etc.

Following Landau, let us call *X's NP*, where X denotes an individual and NP is a member of (500) – a *logophoric extension* of X. A logophoric extension of an individual-denoting noun does not introduce a new individual in the discourse. Thus, there is a clear sense in which *Bill* and *Bill's aunt* denote two distinct individuals in a given discourse domain, however *Bill's development* merely extends or rather focuses attention on some aspect of the denotation of *Bill* alone. Given that NOC PRO seeks a logophoric center and that X's perspective is "pulled up" by a logophoric extension of X, the transparency of the nouns in (500) to control from within is expected.[17]

It is tempting to assimilate the class of logophoric extensions to the class of inalienably possessed nouns. Notice that many members of the former class denote inalienable attributes. Indeed, both abstract and concrete inalienably possessed nouns constitute logophoric extensions for control.

(501) It would ruin Steve's$_i$ figure/career [PRO$_i$ to eat so much ice-cream].

Grammatically, they display distributional parallels.

(502) a. John's hand, *the hand of John
b. John's confidence/career, *the confidence/career of John

More tellingly, even those members of (500) that are compatible with an *of*-genitive, resist it in the context of control.

(503) a. Self discipline benefited John's development / the development of John.
b. It benefited John's development / *the development of John [PRO to discipline himself].

An alternative analysis of these constructions is developed in Wyngaerd 1994: 164. Wyngaerd argues that DP-internal "controllers" as in (504a) do not, in fact, control. Rather, an implicit experiencer argument (projected as *pro*) is

[17] Naturally, only the individual whose attribute is denoted by the containing NP can be said to bear a perspective in the main clause. Hence, we expect transparency in (i) but not in (ii).

i. [PRO$_i$ speaking her mind] is important to Mary's$_i$ confidence.
ii. * [PRO$_i$ speaking her mind] is important to confidence in Mary$_i$.

Sichel (2010) notes that parallel contrasts hold inside DPs. Monadic nouns like *importance* and *significance* induce NOC in their gerundive complement. Overt controllers of PRO in this complement must be logophoric centers.

iii. Mary$_i$ realizes the importance/significance of [PRO$_{i/j/arb}$ behaving herself/himself] for John's$_j$ career.
iv. Mary$_i$ realizes the importance/significance of [PRO$_{i//k/*j/arb}$ behaving herself/*himself] for John's$_j$ sister$_k$.

the true controller, the overt PP being an adjunct of perspective. That the two can co-occur is shown in (504b).

(504) a. [PRO$_i$ finishing his thesis] is important for/to John's$_i$ development.
b. [PRO$_i$ finishing his thesis] is important [to John$_i$] [for his$_i$ development].

Wyngaerd makes this proposal in the context of attempting to reduce apparent cases of NOC into subject clauses to OC. But the proposal is problematic. An overt pronoun in the position of the experiencer argument triggers a condition C violation with the coindexed DP inside the adjunct (505a); if the true controller in (504a) is a null pronoun, it is not clear why a similar violation is not observed. More fundamentally, intuition alone does not support the assumption that sentences like (504a) necessarily involve an implicit experiencer. Indeed, it is quite easy to find examples where no "hidden" experiencer can be posited (505b); in such cases there is no escape from assuming an umediated control relation – inevitably, NOC – between the DP-internal possessor and PRO.

(505) a. * [PRO$_i$ finishing his thesis] is important [to him$_i$] [for John's$_i$ development].
b. [PRO$_i$ finishing his thesis] launched/promoted/boosted John's career.

Before we conclude, let us underscore the fact that logophors are *distinct* from pronouns; in particular, they are far more restricted in distribution and interpretation. Whereas pronouns need not pick a human antecedent, and one whose mental perspective is involved at that, logophors do. Furthermore, pronominal coreference is not subject to the complex distance effects that restrict the dependency between a logophor and potential logophoric centers. Thus contrasts like the following, observed in Bresnan 1982, Lebeaux 1984, Wyngaerd 1994 and Landau 2001, discredit the idea that PRO in NOC is a standard null pronoun (Bouchard 1984, Koster 1984, Hornstein 1999, 2003).

(506) a. [Him$_i$/*PRO$_i$ praising himself so blatantly] embarrassed Bill's girlfriend.
b. People who know John$_i$ often discuss [his$_i$/*PRO$_i$ working too hard].
c. [Him$_i$/*PRO$_i$ having already shaved] shows that Mary arrived more than 3 minutes after John$_i$ did.

To conclude this section, the idea that logophoricity is a key concept in the distribution and interpretation of NOC proves very fertile. Not only does it explain apparent "locality" restrictions on the choice of controller, but it also explains systematic exceptions to them. Unlike purely structural accounts, which stare clueless at syntactically indistinguishable minimal pairs like (492a, 492c), (493a–493b), (496b–496c), (497)–(498) and (506), it offers a real insight into the nature of the condition at work.

## 7.4 Topicality in NOC

There is little doubt that logophoricity plays a key role in NOC. But is it the only non-structural factor involved these constructions? It appears that another important factor is topicality – the antecedent of NOC PRO must be the discourse or the sentence topic.

Examples showing this were discovered very early on by Postal (1970), although they were not perceived as evidence for the relevance of topicality.

(507) a. * Finding out that Greta was a vampire worried somebody.
b. * Falling off the building killed someone.

Postal used these examples to argue for a pronominal analysis of the missing subject in the subject gerund. Overt pronouns in that position display the same resistance to coindexing with the indefinite NP.

(508) a. * $\text{His}_i$ finding out that Greta was a vampire worried $\text{somebody}_i$.
b. * $\text{His}_i$ falling off the building killed $\text{someone}_i$.

However, the deviance of (507) and that of (508) are probably unrelated. Notice that a contrast emerges between PRO and overt pronouns when the controller is a universal quantifier.

(509) a. Finding out that Greta was a vampire worried every friend of hers.
b. * $\text{His}_i$ finding out that Greta was a vampire worried every $\text{friend}_i$ of hers.

Sentences (508)/(509b) are instances of Weak Crossover – a pronoun is bound by a QP occurring to its right. The grammaticality of (509a) does not falsify the pronominal analysis of the missing subject, but merely demonstrates the PRO-gate puzzle (see Section 5.5). PRO-gate should also be available in (507); therefore, the ungrammaticality of (507) must be due to some independent factor. This factor has been identified in Bresnan 1982 and much refined in Kawasaki 1993 (see also Adler 2006). The antecedent of NOC PRO must be the sentence topic – an entry in the common ground of conversation, on which the current sentence makes a comment.

As Kawasaki points out, this requirement immediately explains why definite DPs make much better controllers than indefinite ones in NOC. Indefinite DPs introduce new discourse referents, hence cannot refer to old ones, from which the sentence topic must be selected.

(510) a. [After $\text{PRO}_i$ collecting some money], a bank account was opened by the $\text{landlord}_i$.
b. * [After $\text{PRO}_i$ collecting some money], a bank account was opened by a $\text{businessman}_i$.

Notice that the NOC clauses in (510) are adjuncts while those in (507) are subjects. This difference appears to be immaterial, since the topicality

restriction on the controller applies in both cases, being a general feature of NOC. Another interesting implication is that implicit passive agents (and equivalently, *by*-phrases) do not participate in OC in the way structural subjects do. Otherwise, (510b) should have been as good as (511).

(511) A businessman$_i$ opened a bank account [after PRO$_i$ collecting some money].

The final adjunct in (511) is subject to OC (see Chapter 6), which is indifferent to the topicality of the controller. The initial adjunct in (510) is subject to NOC, which is governed by topicality.

There is independent evidence that even with final adjuncts, "control by implicit agents" is a misnomer; rather, what is found is control by a discourse topic, to which the implicit agent refers. Manzini (1986) observed that an implicit external argument must be interpreted as human when it controls the PRO subject of a temporal adjunct.

(512) a. The avalanche$_i$ hit the house [before PRO$_i$ rolling down the hill].
b. The house was hit.
c. Mary said that the house was hit [before PRO rolling down the hill].

(512a) shows that there is no intrinsic [+human] restriction on OC PRO. Neither is the implicit external argument of the passive *was hit* necessarily human ((512b) can be continued with *by the avalanche*). Still, on the reading where the implicit hitter (rather than *the house*) in (512c) controls PRO, that hitter must be human and cannot be understood to be the avalanche.

Manzini interprets these facts as an indication that PRO in (512c) is really PRO$_{arb}$, which is intrinsically specified as [+human]. This indicates that the linking to the matrix implicit agent is only pragmatic, both PRO and the implicit agent being understood as picking the current sentence topic.

The pair in (448), repeated below, illustrates the same point.

(513) a. The rain$_i$ washed the stairs, [before PRO$_{i/?arb}$ entering the basement].
b. The stairs were washed, [before PRO$_{arb}$ entering the basement].

On the salient reading of (513a), PRO is controlled by the matrix subject. For some speakers, however, a marginal reading exists, with PRO linked to some (arbitrary) discourse antecedent. In (513b) subject control is pragmatically excluded; "control" by the implicit washer is possible, but it must be a human participant, not *the rain*. This is, again, the signature of NOC.

These facts confirm Kawasaki's (1993: 169) conclusion that "control by an implicit agent" is an epiphenomenon of NOC and not a direct syntactic dependency, as explicitly advocated in Roeper 1987 and Baker, Johnson and Roberts 1989.

Kawasaki's careful study (from which most of the examples below are drawn) reveals a great deal of variability in the acceptability of NOC, which is directly

related to the accessibility of the intended controller as a sentence topic. Since animate and human referents are more accessible than inanimate objects as topics, it is harder to override subject control when the subject is [+human].

(514) a. [Before $PRO_{arb}$ entering the basement], the stairs were washed.
b. ?? [Before $PRO_{arb}$ entering the basement], the children were washed.

However, even this preference can be overridden. We have already seen in (480) that cataphoric control by a full DP is less acceptable than by a pronoun. This makes sense: reference to a sentence topic is optimally achieved by a pronoun. However, rich context can make the referent of a full DP salient enough so that it would appear to "control" backwards from a very low position (in violation of any f-command condition). Such examples should be understood as "control by sentence topic," where the low DP merely serves to mention a topic established earlier. Consider the following example (Kawasaki 1993: 205), which appeared in a news article titled "Baker: Back to Basics." The topic of the sentence (as well as of the entire article) is James Baker, which is why it may function as a controller for the adjunct, effectively overriding the [+human] matrix subject.

(515) [Since $PRO_i$ returning to the White House in August], several top Bush advisors have urged $Baker_i$ to be the president's chief surrogate in explaining the administration's economic-recovery plan.

Relatively accessible topic-controllers can be picked by the possessor of the matrix subject. An implied possessor, as in (516b), where the property is understood as the deceased's property, is worse than an explicit one, as in (516a).

(516) a. $My_i$ farm consisted of about twenty acres of excellent land, [$PRO_i$ having given a hundred pounds for my predecessor's good will].
b. [Having left daughters only], the property was sold for the immense sum of £135,000.

Finally, when the entire sentence is making a comment on the referent of the topic, that referent may control without being linked to any grammatical position in the sentence itself.

(517) a. [After PRO pitching the tents], darkness fell quickly.
b. [PRO doubling the point, and running along the southern shore of the little peninsula], the scene changes.

Note that (517a) can only be uttered if describing what happened to whoever pitched the tents and not to anyone else.

The facts surveyed in this section, as those in the preceding one, make a very strong case against purely structural or semantic accounts of NOC and

Super-Equi (Grinder 1970, Chierchia and Jacobson 1986, Hornstein 2003, Boeckx and Hornstein 2007). Both the type of factors involved in determining the acceptability of NOC, and their gradient, variable impact in particular examples, clearly point to the conclusion that NOC falls outside the purview of core grammar and is best analyzed as a complex outcome of pragmatic factors.

## 7.5 Interaction and competition

Let us take stock of what we already know about NOC.

(518) Properties of NOC
a. Distribution
Subject clauses, extraposed clauses, initial (and marginally, final) adjuncts, nominalized complement clauses.
b. Interpretation of PRO
Necessarily [+human], logophoric, topic-oriented.

The first question to ask is – what is the relation between (518a) and (518b)? In other words, is there any linguistically non-trivial link between the distribution and the interpretation of NOC PRO?

In Section 1.4 I have hinted at this link. What is common to all NOC environments is the inapplicability of the OC mechanism. This mechanism can only apply to "transparent" complements – a generalization that holds true whether one takes OC to be binding, movement or Agreement. The environments in (518a) are opaque. The predication mechanism discussed in Chapter 6 extends to adjunct OC, but only to those adjuncts that are c-commanded by the matrix subject, namely, final adjuncts that are not set off with a pause.

Because of their opacity to syntactic OC, the environments in (518a) form the "elsewhere" context of NOC. Because syntax cannot identify the content of PRO in these environments, extra-syntactic modules come into play. As we saw above, these largely reduce to pragmatics. Hence the path from (518a) to (518b).

A certain unclarity persists regarding the division of labor between the two pragmatic dimensions discussed in Sections 7.3 and 7.4 – logophoricity and topicality. Each was studied in isolation, which raises the obvious question: Are the two dimensions necessary? Do they overlap? Can they be conflated?

These questions have received little if any attention in the literature. The very few linguists who have studied the pragmatics of NOC are rather vague on the relation of "logophoricity" to "topicality."[18] There is no systematic attempt to

[18] Kawasaki (1993: 200) writes: "The feature of [+topic-oriented] might be thought of as akin to features that define logophoric pronouns, though it does not require any specific role such as 'point of view' on the part of the antecedent." Lyngfelt (2000: 32) writes: "The logophoric center is usually the topic of the sentence, typically an initial subject, and infallibly a pragmatically salient referent." He then uses LOG as a cover term for *all* pragmatic aspects of control.

tease apart the effects of logophoricity from those of topicality; there are no empirical results to consider. Thus, the following remarks will be inevitably tentative.

It is often said that animate and human referents make better topics than inanimate ones. If true, this tendency compounds the problem of distinguishing logophoricity effects from topicality effects, as both implicate a [+human] referent. Nevertheless, few linguists would claim that being [+human] is *definitional* for topics. Thus, one can explicitly set up a context with a non-human topic and attempt to access it as a NOC controller. The following example is modeled on Williams' example (465).[19]

(519) As for the boots$_i$, it was obvious
[that [for them$_i$/*PRO$_i$ to be produced in Italy] would increase their appeal].

Despite the topicality of *the boots*, it cannot control PRO in the subject clause. This could be interpreted as either a violation of the [+human] restriction on NOC PRO or the logophoricity condition. Is there a way to tell?

If the [+human] restriction is a by-product of logophoricity, the latter must be a necessary condition on NOC. One would then predict that [+human] *non*-logophoric antecedents, which are nevertheless topical, would fail to control. Again, relevant examples are difficult to construct, but the following one, from Richardson 1986, is pertinent.

(520) All I can say about Mary$_i$ is that most people I have spoken with agree that while [PRO$_i$ removing herself from the race so quickly] may have pleased the party hacks, it will surely distress the people whose interests she represents.

The beginning of this sentence introduces *Mary*, a [+human] referent, as the topic. Nevertheless, *Mary* is not a logophoric center, being a subject matter of other people's thoughts and not a mental participant in the event. The fact that NOC succeeds here, therefore, supports the (tentative) conclusion that logophoricity is not a necessary condition on NOC, although the [+human] restriction is; which means that the latter is irreducible to the former, and

[19] Examples (465) and (519) militate against Lyngfelt's (2000) claim that it is more important for a controller to c-command PRO than to be a logophoric center. Lyngfelt's analysis is couched in Optimality Theory, where different syntactic and semantic constraints on control are ranked according to their relative prominence. Crucially, the same set of constraints applies in OC and NOC. The reason why Lyngfelt ranks C-COM above LOG is that logophoric control gives way to (almost obligatory) subject control in the case of final adjuncts. We have explained this fact with the assumption that OC (which applies to final adjuncts) and NOC (which applies to initial adjuncts) are distinct phenomena, falling under different grammatical principles (and modules). The problem for Lyngfelt is thus the following: to explain the (near) absence of logophoric control in final adjuncts he must rank C-COM above LOG, but to explain the failure of control in (465) and (519) he would have to reverse the ranking. The obvious solution is to posit two distinct grammars. In the OC grammar, LOG is inoperative (cf. (458)–(459)), whereas in the NOC grammar, it is in tie with topicality (see (522) below).

constitutes a primitive feature of NOC PRO, as proposed in some of the earlier studies (Chomsky 1981, Rizzi 1986a).

Left to be established is the status of the topicality condition – is it necessary or sufficient? In fact, quite a few of the examples given in Section 7.3 appear to be neutral with respect to the topicality of the controller. Explicit marking of a topic distinct from the controller does not reduce their acceptability. For example:

(521) a. As for today's lawsuit, $\text{John}_i$ sued Mary for divorce because it was no longer possible [$\text{PRO}_i$ to support her].
b. Concerning Times Square, [$\text{PRO}_i$ to find himself alone there] became one of $\text{John's}_i$ most abiding fears.

From this we may conclude that topicality, like logophoricity, is sufficient for NOC (of $\text{PRO}_{[+\text{human}]}$) but not necessary. The overall shape of the pragmatic determination of NOC is summarized below. Note that this characterization only applies to NOC environments, OC environments falling under entirely different conditions.

(522) *Pragmatics of NOC*
In a NOC configuration [ . . . DP . . . [PRO . . . ] . . . ] (order irrelevant), DP may control PRO iff DP is [+human] *and* either a logophoric center or topic-oriented.

The status of (522) has yet to be confirmed outside English. It also invites further research questions about last-resort strategies, the points of contact between syntax and pragmatics, and the role of constraint competition in modulating their interface.

### *Further reading*

For relevant works on the topic of Chapter 7, see Grinder 1970, 1971, Kimball 1971, Neubauer 1972, Kuno 1975, Clements 1975, Jacobson and Neubauer 1976, Williams 1980, 1992, Bresnan 1982, Manzini 1983, Mohanan 1983, Epstein 1984, Lebeaux 1984, 1985, Bouchard 1984, 1985, Borer 1985, Chomsky 1986, Richardson 1986, Chierchia and Jacobson 1986, Kawasaki 1993, Hornstein 1999, Lyngfelt 1999, Manzini and Roussou 2000, Rooryck 2000, Landau 2000, 2001, 2007, Adler 2006, Boeckx and Hornstein 2007, Constantini and Laskova 2009.

# 8 Conclusion

One might have reached this point in the book with some disappointment. The preceding chapters have systematically deconstructed the notion of "control" and replaced it with a multitude of (sub)theories and analyses. By now it seems quite evident that "control" is neither a unitary phenomenon nor a constitutive element of grammatical theory. Rather, it is an "aggregate concept," a superficial heuristic label only serving to draw our attention to a certain class of linguistic facts. This shift, however, is anything but unusual in scientific inquiry, where advances in knowledge regularly bring about the dissolution of preliminary (and intuitive) theoretical categories. Indeed, the history of generative grammar has seen this happen again and again. Consider how initially unitary the theories of "islands," "agreement" or "subjecthood" were, and how they all gradually became ever more empirically fragmented. There is little doubt that this fragmentation was, in fact, marked by an *increase* in explanatory power, not decrease, as the novel theoretical notions recruited to shed light on the phenomena were several degrees of order more fundamental and general than the superficial labels with which the inquiry had begun. Such was the case, I believe, in the domain of control as well.

Consider what this means concretely. A major concern of grammatical theory, since the early 1980s to this day, has been to identify the precise factors that determine whether a given argument position must, may or may not be pronounced. This concern cuts across a broad range of empirical domains: chain formation, ellipsis, *pro*-drop and lexical saturation. The status of PRO, the unpronounced controlled subject, lies squarely within this concern and has, indeed, had a major impact on the theory of null categories. A second grammatical concept that closely interacts with control is *finiteness*; exactly what notions of finiteness are crosslinguistically valid and insightful and what concepts are not, depends, to a significant extent, on the distribution of controlled clauses across languages. Consider next the vexing lexical issue of how best to decompose and represent the structure of complex events; the effect of this choice has specific implications for, hence is *constrained* by, the choice of controller (with triadic verbs). Theories of nominalizations must take into consideration the analogies and *dis*analogies between control in clauses and

control in nominals; theories of variable binding (including Weak Crossover) are not complete without accommodating the peculiar PRO-gate phenomenon; and the treatment of logophoric expressions must be able to extend to PRO in NOC, which is also a logophor.

Seen that way, the disintegration of "the theory of control" is really the *advancement* of other grammatical theories. A vast amount of knowledge about control constructions has been accumulated over the past forty-five years. As this book aimed to show, this knowledge can be systematized so that significant generalizations and theoretical principles can be extracted from it. These results, in turn, feed into the general linguistic theory and deepen our understanding of core grammatical mechanisms.

Difficult questions remain open; some of them are as old as the earliest studies of control. Perhaps more than in other areas of linguistic research, problems in control are challenging in that they bear no obvious mark as to *which* part of the grammar they belong to; lexicon, syntax, semantics or pragmatics – the proper analysis is always up for grabs. If history is any clue, the future of control holds many more surprises.

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# Language index

# Name index

# Subject index