

# 1 Background

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## 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  $\Rightarrow$   
 1 2 3  $\emptyset$   $\emptyset$  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.,  $A \Rightarrow \emptyset$ , 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.

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

An NP<sub>j</sub> is erased by an identical NP<sub>i</sub> iff there is a clause S such that:

- (i) NP<sub>j</sub> is dominated by S.
- (ii) NP<sub>i</sub> neither dominates nor is dominated by S.
- (iii) For all NP<sub>k</sub> neither dominating nor dominated by S, the distance between NP<sub>j</sub> and NP<sub>k</sub> is greater than the distance between NP<sub>j</sub> and NP<sub>i</sub>, 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*: [<sub>VP</sub> V [<sub>NP</sub> 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*: [<sub>VP</sub> V [<sub>PP</sub> P [<sub>NP</sub> 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*: [<sub>VP</sub> 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.<sup>1</sup>

- (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.

<sup>1</sup> 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.

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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.<sup>2</sup>

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

- (12) a. [*\*His<sub>i</sub>* realizing/realization that the world was exploding] worried somebody<sub>*i*</sub>.  
 b. \* [*PRO<sub>i</sub>* realizing/the realization that the world was exploding] worried somebody<sub>*i*</sub>.

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<sub>*i*</sub> and Betty<sub>*j*</sub> argued about [*PRO<sub>i+j/\*i/\*j</sub>* visiting you].  
 b. Harriet<sub>*i*</sub> and Betty<sub>*j*</sub> argued about [*their<sub>i+j</sub>/her<sub>i/\*j</sub>* visiting you].  
 c. Harriet<sub>*i*</sub> argued with Betty<sub>*j*</sub> about [*PRO<sub>i+j/i/j</sub>* visiting you].  
 d. Harriet<sub>*i*</sub> argued with Betty<sub>*j*</sub> about [*their<sub>i+j</sub>/her<sub>i/j</sub>* 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

<sup>2</sup> 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<sub>i</sub> wants John<sub>i</sub> 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.<sup>3</sup> 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).<sup>4</sup>

<sup>3</sup> 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.

<sup>4</sup> 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.

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- (14) a. \*Lorenzo<sub>i</sub> thought [that Sue would be impressed [by Ø<sub>i</sub> holding his breath for ten minutes]].  
 b. \*Roger<sub>i</sub> urged Sue<sub>j</sub> [Ø<sub>j</sub> to declare that [[Ø<sub>i</sub> 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<sub>j</sub>, 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<sub>i</sub> said that [Joan<sub>j</sub> knew that [it was necessary [Ø<sub>i+j</sub> 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 felicitous in a context where the latter is.<sup>5</sup>

- (17) a. John is waiting for me to be introduced, and I'm waiting [<sub>S</sub> for me to be introduced], too.  
 b. \* John is waiting for me to be introduced, and I'm waiting [<sub>S</sub> 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)<sub>i</sub> [<sub>x<sub>i</sub></sub> remembers <sub>x<sub>i</sub></sub> 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,

<sup>5</sup> 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).<sup>6</sup>

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

<sup>6</sup> 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



## 1.2 Raising-control contrasts

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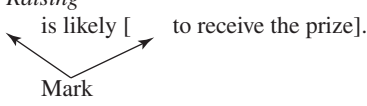
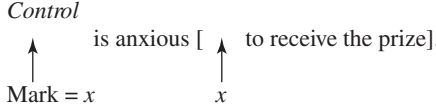
accounts of raising and control, they still share a core understanding of what makes these grammatical phenomena different. The fundamental insight has remained the same from its earliest statement (see Chomsky 1965: 22–24). It is a cornerstone discovery of generative grammar, and one that makes a superb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

In this section, I survey a large number of empirical contrasts between raising and control.<sup>7</sup> 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  $\theta$ -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  $\theta$ -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)

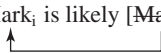
- (21) a. *Raising*  
  
 is likely [ to receive the prize].  
 Mark
- b. *Control*  
  
 is anxious [ to receive the prize].  
 Mark = x                      x

<sup>7</sup> 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).

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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<sub>i</sub> is likely [~~Mark<sub>i</sub>~~ to receive the prize].  
  
 b. *Control*  
 Mark<sub>i</sub> is anxious [PRO<sub>i</sub> 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