SYNTAX

CRITICAL CONCEPTS IN LINGUISTICS

Edited by
ROBERT FREIDIN AND HOWARD LASNIK

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Volume VI
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CONTENTS

VOLUME VI CONDITIONS ON DERIVATIONS AND REPRESENTATIONS (3)

INTRODUCTION

The final volume of this collection covers three topics: control theory (Chapters 84–86), economy (Chapters 87–89), and minimalism (Chapters 90–95). There are of course significant connections between the various topics as discussed in some of the chapters. Thus Chapter 86 evaluates control theory from the perspective of the minimalist program. Moreover, economy considerations underpin much of minimalist analysis.

The topic of control concerns the distribution and interpretation of the null subject element PRO that occurs in infinitival and gerundive constructions. As Chomsky notes in §2.4.3 in *Lectures on Government and Binding* (Ch. 84), there are three questions about PRO.

(1) a. where may it occur?
    b. where must it occur?
    c. how is its reference determined?

Under GB, the answer to (1a) follows from theories of government and binding,[1] i.e. the PRO Theorem (see Ch. 80, Vol. V) and the answer to (1b) follows from the Projection Principle and Case Theory. The answer to (1c), Chomsky proposes, is the domain of control theory. In the course of considering a range of control structures, Chomsky concludes that the theory involves three distinct factors: structural configurations, intrinsic properties of verbs (as illustrated by the contrast between (2a) and (2b), and other semantic/pragmatic considerations.[2]

(2) a. Mary promised John [PRO to leave on time]
    b. Mary persuaded John [PRO to leave on time]

The constructions in (2) are examples of obligatory control (OC) where the verb determines which NP acts as the antecedent of PRO, the matrix subject in (2a) but the matrix object in (2b). Chomsky also discusses instances of PRO that have no antecedent in the sentence in which they occur – called arbitrary PRO (PRO_{arb}), as in (3).

(3) it is difficult [PRO to get an A in math]

PRO_{arb} also occurs in purposive clauses, as in (4).

(4) the books were sold [PRO to help the refugees]

However the PRO in purposive clauses can sometimes take an antecedent, where PRO can be construed as either *I* or *Bill*.

(5) I gave Bill the books [PRO to help the refugees]

In constructions like (5) where there is no unique obligatory controller, we have nonobligatory control (NOC). Chomsky discusses other cases where the interpretation of PRO involves an ambiguity in the choice of antecedent. He also notes constructions where the antecedent of PRO does not c-command PRO and others where the antecedent can be remote – i.e. not in an adjacent clause. As he notes, PRO shares these last two properties with pronouns in contrast to NP-trace. What remains to be specified is what principle or principles account for how the reference properties of PRO are determined.[3]

Lasnik's 1992 paper "Two notes on control and binding" (Ch. 85) spells out in some detail the empirical basis concerning the syntactic distribution of PRO and the related question of how its antecedent is selected. On the comparison of PRO to lexical bound anaphors, Lasnik notes that the two elements have different antecedent properties and different bound element properties. In English, OC PRO has a specified antecedent whereas an anaphor does not. However, in Polish, where only subjects can bind lexical anaphors, OC PRO can be object controlled. Regarding bound element properties, OC PRO involves a thematic requirement that doesn't exist for lexical anaphors. For example, PRO in the clausal complement of *serve* must be interpretable as an instrument, as illustrated in (6).

(6) a. the ice served [PRO to chill the beer]
b. *the ice served [PRO to melt]

This requirement imposed on OC PRO accounts for the deviance of (6b) where the subject of intransitive *melt* is not interpretable as an instrument. Lasnik cites additional cases involving object as well as subject control.

The second part of this chapter deals with the nonexistence of expletive PRO. This follows in part whenever a thematic requirement is imposed on PRO because an expletive by definition does not bear a θ-role. Furthermore, given that "controlled PRO normally assumes the referential properties of its antecedent" (Chomsky 1981: 324), whenever the controller has an independent θ-role, PRO again cannot be an expletive. This leaves one option to eliminate – namely, the possibility of an expletive controller. To eliminate expletive PRO entirely, Lasnik develops the analysis of NP

licensing (cf. Chomsky 1986). He suggests that PRO NPs are licensed either by control or by the assignment of *arc*. Given that *arc* carries the feature [+human], it cannot be assigned to an expletive. He then addresses the more complicated case of expletive PRO with a potential expletive controller. Lasnik gives a somewhat intricate argument that expletive PRO can never be assigned an index by an expletive controller because expletives are never indexed and therefore a PRO that they might control can never be licensed.

Hornstein's 1999 article "Movement and control" (Ch. 86), takes a radically different approach to the analysis of control constructions. Challenging the standard consensus that there is a grammatical formative PRO, Hornstein proposes that obligatory control be assimilated to NP movement – hence OC PRO is actually an NP trace, whereas nonobligatory control involves the pronominal element pro. The movement analysis of OC PRO requires the rejection of two related central parts of syntactic theory. One is the restriction that θ-role assignment applies only with external merge; the other, the part of the θ-Criterion that restricts chains to having a single θ-role (i.e., Functional Uniqueness of Freidin 1978 (Ch. 66, Vol. IV)).[4] Given these restrictions, control and raising constructions (e.g. (7a) and (7b), respectively) must have different syntactic derivations where only the latter involves movement.

(7) a. John tried to understand.
    b. John seemed to understand.

Hornstein argues that the differences between the two constructions do not require the technical apparatus employed to distinguish them. This includes increasing the inventory of empty categories by adding PRO, as well as "massively" complicating the grammar with the addition of a control module (which remains to be formulated precisely) and further theoretical modifications to account for the distribution of PRO. Part of Hornstein's argument against the standard consensus includes a detailed critique of the GB approach and also null Case approach of Chomsky and Lasnik 1993 (see Ch. 71, Vol. V).

Hornstein's movement analysis of obligatory control is based on several assumptions, the first three (maybe four) of which are controversial:

(8) a. θ-roles are features on verbs
    b. θ-role assignment occurs via feature checking
    c. there is no upper bound on the number of θ-roles a chain may have
    d. sidewards movement is permitted
    e. Greed is enlightened self-interest

Hornstein considers the movement approach to be "an exercise in grammatical downsizing" that leads to a "radical simplification of the grammar

of control". It derives the basic properties of obligatory control structures – i.e. that PRO must have a local antecedent that c-commands PRO. It also explains why OC PRO cannot take split antecedents.[5]

Hornstein's movement analysis of control is based on an economy argument that a grammar that employs the fewest theoretical entities and devices is the most highly valued. Such economy considerations have been in the background of work in modern generative grammar since its inception (see Chomsky 1951) and have been at the heart of rational inquiry into the natural world since at least the Middle Ages (in the guise of Ockham's razor). In the late 1980s Chomsky brought the issue of economy considerations to the forefront of work in syntactic theory in his "Some notes on economy of derivation and representation" (Ch. 87).[6] This renewed focus on economy considerations prepared the groundwork for the postulation of a minimalist program for linguistic theory a few years later (Chomsky 1993 (Ch. 90)).

Chomsky's essay on economy is concerned with an investigation of general guidelines for language design in an effort to formulate them as general principles of UG within the Principles and Parameters framework. Chomsky proposes that these guidelines have a "least effort" flavor "in the sense that they legislate against 'superfluous elements' in representations and derivations." He mentions Full Interpretation (FI, Chomsky 1986) and the last resort condition on movement as primary examples, the former excluding superfluous elements in representations and the latter, superfluous steps in derivations. The essay explores some empirical effects of such guidelines.

The first half is concerned with properties of the verbal inflection system (adapting some proposals of Pollock 1989 (see Ch. 10, Vol. I)), where Chomsky takes the Head Movement Constraint (HMC, Travis 1984; see also Ch. 46, Vol. III)) to be an important descriptive fact that requires an explanation. He attempts to reduce the HMC to independently motivated principles – in this case, the ECP with respect to antecedent government. The reduction requires that deletion, like movement, be a last resort operation governed by the principle (9):

(9) Deletion Principle: X cannot delete if it plays a role at LF, otherwise it can.

Thus the HMC is reduced to the ECP under least effort guidelines. The analysis suggests a more specific interpretation of "least effort" – namely, use the least costly derivation where cost is determined by the length of the derivation. Chomsky also proposes a more subtle meaning of "cost" whereby UG principles are less costly than language-specific rules.[7]

The second part of the essay deals with the economy of representations – specifically, the empirical consequences of FI, the intuitive content of which is that representations contain no superfluous symbols. Chomsky

cites vacuous quantification as in (10) as one example, where the quantifier *who* binds no variable at LF.[8]

(10) *who John saw Bill

The discussion in this section is primarily concerned with what elements are legitimate in LF representations, focusing on expletive elements in existential constructions as the empirical issue. Chomsky reverses his earlier LF analysis (1986) where expletives were removed by a rule that replaced them with their associate NP, claiming that an expletive has an interpretable feature that cannot be deleted and therefore must remain as an affix adjoined to its associate at LF. He considers some conditions on the expletive-associate (E-A) chain and concludes that the chain must satisfy Principle A of the binding theory and the ECP. He also uses the E-A chain to argue against a process of Case transmission.

In his concluding remarks on language design, Chomsky points out that although economy conditions "have a kind of naturalness and generality lacking in specific principles of UG such as the ECP, binding theory, and so on, their formulation is, in detail, specific to the language faculty." Chomsky suggests that issues of language design should be considered independently from issues of language use (e.g. processing) because language design appears to be "elegant" whereas processing does not. He notes that conditions on economy of representations are not easily motivated in terms of processing considerations because they apply at LF (and only derivatively at S-structure). "There is no reason to suppose, a priori, that the general design of language is conducive to efficient use."

Bošković's 1998 paper "Multiple wh-fronting and economy of derivation" (Ch. 88) uses the phenomena of multiple wh-movement in South Slavic languages[9] to compare an economy analysis against a more traditional approach based on the Superiority Condition (Chomsky 1973, see Ch. 57, Vol. IV). Bošković demonstrates that the complex patterns of multiple wh constructions found in these languages, including the differences between Bulgarian and Serbo-Croatian, are easily accommodated under an economy analysis, but not under a straight Superiority analysis. The paper shows that in Serbo-Croatian cases of multiple wh-movement, one of the fronted wh-phrases is actually in a focus position in front of IP but lower than Spec-CP. A central question for this phenomenon is why the focus movement of wh-phrases in Serbo-Croatian does not show Superiority effects in contrast to wh-movement, which does. Bošković's solution involves the location of strong features that motivate overt movement. He claims that the functional head C of an interrogative construction has a strong feature which attracts a wh-phrase to its Spec position, whereas functional head of the focus construction F has a weak feature, which does not attract the movement of a wh-phrase. Instead, for focus constructions it is the wh-phrase that

contains a strong feature [+wh], which forces it to move.[10] Thus the difference between wh-movement and focus movement is a difference between displacement by Move vs. Attract. Bošković proposes that Attract adheres to economy along the lines of shortest distance, therefore a subject wh-phrase undergoes wh-movement rather than an object wh-phrase, whereas Move does not.[11] Bulgarian differs from Serbo-Croatian in that C is the locus of both the [+wh] and focus features.

Economy of derivation as formulated in Chomsky 1991 (Ch. 87) is characterized as eliminating "superfluous steps" from derivations. One way to determine absolutely whether a given step *S* in a derivation of some sentence under analysis *SA* is superfluous is to compare derivations of *SA*. If there exists a shorter derivation of *SA* that does not include *S*, then *S* is a superfluous step. Thus economy of derivation favors derivations with the fewest steps – i.e. the shortest derivation.[12] Such a notion of economy is global in character in that it applies across derivations and thereby involves considerable computational complexity. In contrast to this global version of economy of derivation, Collins 1997 (the first two chapters of which are excerpted here as Ch. 89) proposes an alternative version that is local in character. Under Collins's local economy of derivation, decisions about whether a grammatical operation may apply at a certain point in a derivation are based solely on the information available at that point. Global comparisons of competing derivations are simply not available.

The significant computational complexity involved in the application of global economy conditions constitutes the strongest argument against such conditions. Collins offers two additional arguments. Local economy is superior empirically because it allows for an analysis of inversion constructions (e.g. locative inversion), which are problematic under the global version. Also, the notion "fewest steps" entails counting, which is a function that in general grammars do not perform.[13]

Collins characterizes a derivation as a series of grammatical operations that relate the three components consisting of the lexicon and the PF and LF interfaces. Derivations involve a numeration (i.e. an array of lexical items) and the operations Select (which extracts a lexical item from the numeration), Merge, Move (interpreted as Copy + Merge)[14] and Delete. Given local economy there are only two real economy conditions, Last Resort (LR) and Minimality.

(11) a. LR: An operation OP involving α may apply only if some property of α is satisfied.
b. Minimality: An operation OP (satisfying LR) may apply if there is no smaller operation OP′ (satisfying LR).

Other economy conditions (e.g. Greed as formulated in Chomsky 1995a (Ch. 24, Vol. I) and Procrastinate as formulated in Chomsky 1993 (Ch. 90)),

being global, must be eliminated. Collins mentions several strategies for doing this, including the replacement of a global condition with a local one.

The second chapter of Collins 1997 covers a number of assumptions that are central to the analyses proposed and then provides an analysis of locative inversion constructions. Section 2.1 demonstrates that the EPP feature of T is independent of the Case feature of T and therefore that they can be satisfied by different elements. The EPP feature is strong, whereas the Case feature is (universally) weak. Section 2.2 deals with clause structure. Following Chomsky 1995b, Collins does not postulate Agr projections. He assumes an intermediate functional projection TrP between TP and VP.[15] Section 2.3 clarifies LR by defining checking domains and characterizing checking as deletion. Section 2.4 explicates Minimality with a discussion of object shift (see Johnson 1991 (Ch. 30, Vol. II), Holmberg 1999 (Ch. 31, Vol. II), and Lasnik 1995a (Ch. 48, Vol. III)) in Icelandic. Section 2.5 spells out arguments against incorporating conditions like LR and Minimality as part of the definition of the displacement operation (Move or Attract).

Section 2.6 lays out an analysis of locative inversions constructions, as in (12a) (compared to its non-inverted counterpart (12b)).

(12) a. Down the hill rolled John.
b. John rolled down the hill.

Collins assumes that the subject *John* merges as Spec-VP. VP is the complement of the functional head Tr. The derivation proceeds with V moving to Tr and then T merging with TrP. The EPP, involving a strong feature, must be satisfied overtly with either the DP *John* or the PP *down the hill* moving to Spec-TP. If the latter happens, then (12a) is derived; if the former, then (12b). The derivation of (12a) involves an additional step: The Case feature of *John* must move to T covertly to be checked,[16] whereas in (12b) the same Case feature is checked when *John* moves overtly to Spec-TP to satisfy the EPP. Therefore the derivation of the locative inversion construction (12a) involves one more step than the derivation of its counterpart (12b). Global economy would incorrectly block the derivation of (12a), whereas under local economy it is viable because it satisfies both LR and Minimality.

A minimalist program for linguistic theory was first articulated in Chomsky 1993 (Ch. 90), an article whose title is identical to the first NP of this sentence. As Chomsky has since remarked several times, the minimalist program that he and others are pursing within generative grammar is a program of research that addresses certain abstract fundamental questions concerning linguistic theory; it is not a specific theory, or even a model or framework in which specific theories can be developed. "There are minimalist questions, but no specific minimalist answers" (Chomsky 1996: 119–120), a comment that still applies almost a decade later. Given the abstract nature

of the two interrelated questions that the minimalist program addresses (13), it is easy to understand why this is still the case.[17]

(13) a. To what extent is language a "perfect system"?
b. Is the computational system for human language C_{HL} optimal?

Nonetheless, it is clear that the notions of economy of derivations and representations play a significant role in providing some tentative answers.

In Ch. 90, Chomsky begins by laying out some basic assumptions, which he takes to be part of the minimalist program. Some, like the assumption that the mind/brain contains a language faculty that interacts with other cognitive systems, have been around virtually from the beginning of modern generative grammar. Others, like the assumption that the initial state (S_0) of C_{HL} contains invariant principles and parameters, belong to the Principles and Parameters framework, which constitutes the basic framework in which the minimalist program is being explored. A few, like the assumption that the interface levels LF and PF are the only relevant linguistic levels of representation, are unique to the formulation of the minimalist program.[18] The article proceeds with a discussion of fundamental syntactic relations, primarily in X-bar theoretic terms. In this section Chomsky rejects the notion of government as illegitimate, proposing instead to derive the empirical effects of government analyses from more basic concepts.[19] The following discussion covers some conceptual and empirical problems for a level of D-structure. Chomsky goes on to resurrect the device of a generalized transformation GT (cf. Chomsky 1955/1975), which is formulated as a binary substitution operation that maps two independent phrase markers (K, K[1]) onto a single phrase marker K*. Along with this binary substitution operation,[20] Chomsky formulates a singulary substitution operation Move α that maps K onto K* governed by an "extension" version of the strict cycle.[21] The remaining sections deal with issues concerning the postulation of a level of S-structure.

One question concerns the position of Spell-Out, the point in a derivation where phonetic material is separated from semantic material, the former relevant to PF but not LF and the latter to LF but not PF – S-structure in GB theory. Chomsky proposes that Spell-Out applies freely, the optimal conclusion, hence there is no special level of S-structure. Spell-Out is motivated by the economy condition FI. In PF, semantic features are assumed to be uninterpretable and therefore in violation of FI – and similarly for phonetic features at LF. Chomsky extends this analysis by designating certain formal features like structural Case and verbal agreement as uninterpretable at LF. Therefore they must be eliminated during the derivation.[22] Chomsky uses this feature analysis to formulate the "last resort" character of movement as the economy condition Greed, which allows a constituent to move only for the purpose of checking one of its uninterpretable

features.[23] In addition, the economy condition Procrastinate imposes a preference for covert over overt movement. These formulations depend on a further distinction between strong and weak features.[24] Strong features must be eliminated from the derivation as soon as possible, whereas the elimination of weak features can be postponed to after Spell-Out. In this way, the feature theory in conjunction with FI, Greed and Procrastinate facilitate the free application of Spell-Out.[25]

Chomsky also discusses the issue of empirical evidence for a level of S-structure, arguing that in many cases this evidence can be reanalyzed in a way that doesn't require postulating such a level. Some of the evidence concerns the interaction of binding theory and the particular form of representations at LF. Under trace theory, in which a moved constituent leaves behind a coindexed empty category marker, certain empirical problems arise – for example, those that appear to require a reconstruction of the trace as its coindexed phonetically realized counterpart so that binding theory will apply properly at LF. Chomsky eliminates the need for reconstruction as a special LF operation by adopting a copy theory of movement, whereby a "trace" is actually a copy of the moved item. Further operations at LF will reduce the resulting chain to the appropriate "reconstruction" configurations. Adopting the copy theory of movement operations, which is the null hypothesis,[26] allows for the elimination of a special reconstruction operation, both of which are consistent with the minimalist goal of reducing grammatical machinery to the bare essentials.

The elimination of D-structure and S-structure along with the introduction of the economy conditions Greed and Procrastinate created a radically new environment for syntactic analysis. Lasnik's 1995 article "Case and expletives revisited: on Greed and other human failings" (Ch. 91) explores this new analytic matrix as it applies to the analysis of existential constructions (see Stowell 1978 (Ch. 44, Vol. III)) – in particular, the question of Case licensing for the expletive element *there* and its associate NP – e.g. *a strange man* in (14).

(14) There is [$_{\alpha}$ a strange man] in the garden.

Rejecting a Case transmission analysis whereby the associate α receives the Case assigned to the position of the expletive (cf. Chomsky 1986), Lasnik adopts the analysis of Belletti 1988 and Lasnik 1992 in which the associate is assigned an independent "partitive" Case[27] by *be*. He treats the expletive as an LF affix, following Chomsky 1991 (Ch. 87), and therefore the associate must raise at LF to support the affix. Given that the associate has its Case checked independently of the expletive, this movement is not motivated by the need to check a weak feature of the associate; thus Greed is not involved. Lasnik uses this analysis to argue for revising