

MP Ch. 4 quotes and notes**Reference sets for economy comparisons**

- (1) “As a first approximation, let us take the numeration to determine the reference set: in evaluating derivations for economy, we consider only alternatives with the same numeration.” p.227

<<The numeration consists of the items to be included in the derivation, plus an indication of how many times each will occur. In mathematical jargon, it is a ‘bag’ or ‘multi-set’>>

- (2) “Selection of an optimal derivation in the reference set determined from the numeration N poses problems of computational complexity too vast to be realistic. We can reduce the problem with a more "local" interpretation of reference sets. At a particular stage A of a derivation, we consider only continuations of the derivation already constructed-in particular, only the remaining parts of the numeration N. Application of the operation OP to A is barred if this set contains a more optimal derivation in which OP does not apply to A. The number of derivations to be considered for determining whether OP may apply reduces radically as the derivation proceeds.” p.227

Features and their nature

- (3) “A core property of C_{HL} , is feature checking, the operation that drives movement under the Last Resort condition. A large part of our concern will be to examine these notions. We can begin by reducing feature checking to deletion: a checked feature is marked ‘invisible at the interface.’” pp.228-9
- (4) “...we distinguish two types of lexical feature: those that receive an interpretation only at the A-P interface (phonological) and those that receive an interpretation only at the C-I interface. I assume further that these sets are disjoint, given the very special properties of the phonological component and its PF output.” p.229
- (5) “It is reasonable to suppose that overt operations do not delete phonological features; otherwise, there would be little reason for them to appear in a lexical item at all. Suppose this to be so. By the assumption of uniformity of C_{HL} , it follows that covert operations cannot do so either; if any phonological features enter the covert component (after Spell-Out), the derivation will crash at LF, violating FI. We will make the still stronger assumption that overt operations cannot detect phonological features at all-such features cannot, for example, distinguish one overt operation from another. Thus, the phonological matrix of a lexical item is essentially atomic, as far as overt operations are concerned. It is the form in which the instructions for certain rules of the phonological component are "coded" in the lexical item. For the $N \rightarrow \lambda$ computation, nothing would change if the phonological properties of book were coded in the lexicon as 23, with a rule of the phonological component interpreting 23 as the phonological matrix for book.” p.229

- (6) “Among the features that appear in lexical entries, we distinguish further between formal features that are accessible in the course of the computation and others that are not: thus, between the formal features [\pm N] and [\pm plural], and the semantic feature [artifact]... Such features also function differently in the phonological component. Since we take computation to LF to be uniform, we cannot stipulate that certain features are eliminable only after Spell-Out ” p.230
- (7) “The lexical entry for airplane, for example, contains three collections of features: phonological features such as [begins with vowel], semantic features such as [artifact], and formal features such as [nominal]. The phonological features are stripped away by Spell-Out and are thus available only to the phonological component; the others are left behind by Spell-Out, and the formal ones may continue to be accessed by the covert computation to LF.” p.230
- (8) “The collection of formal features of the lexical item LI I will call FF(LI), a subcomplex of LI. Thus, FF(*airplane*) is the collection of features of *airplane* that function in the $N \rightarrow \lambda$ computation, excluding the phonological and (purely) semantic features. Some of the features of FF(LI) are intrinsic to it, either listed explicitly in the lexical entry or strictly determined by properties so listed. Others are optional, added as LI enters the numeration.” p.231
- (9) “In the case of *airplane*, the intrinsic properties include the categorial feature [nominal], the person feature [3 person], and the gender feature [- human]. Its optional properties include the noncategorial features of number and Case. The intrinsic properties of *build* include the categorial feature [verbal] and the Case feature [assign accusative], but its ϕ -features and tense are optional (if internal to the item). Choices of lexical item LI with different optional features are distinct members of the numeration. If (*airplane*, *i*) is in the numeration, its first term must include the categorial feature [nominal] and the noncategorial features [3 person], [-human], as well as one or another choice among number and Case features – perhaps [plural] and [accusative], in which case it may appear in a convergent derivation for *we build airplanes*.” p.231
- (10) “A guiding intuition of the Minimalist Program is that operations apply anywhere, without special stipulation, the derivation crashing if a "wrong choice" is made. Let us assume this to be true of Spell-Out, as of other operations. After Spell-Out, the phonological component cannot select from the numeration any item with semantic features, and the covert component cannot select any item with phonological features. That is a requirement for any theory on the weakest empirical assumptions; otherwise, sound-meaning relations would collapse.” p.231
- <<Note that Spell-Out now isn't merely a point in a derivation, like DS or SS, but is an **operation**.>>
- (11) “The operation Select is available to the covert component, however, assuming the uniformity condition on the $N \rightarrow \lambda$ computation. But if an item with phonological features is selected, the derivation will crash at LF. Selection of LI must be overt, unless

LI has no phonological features. In this case LI can be selected covertly and merged (at the root, like overt merger, for simple reasons to which we return).” p.232

Feature strength

(12) “... can a (phonologically null) lexical item with a strong feature be selected covertly? To clarify the issues, we have to settle the status of the strength property. Feature strength is one element of language variation: a formal feature may or may not be strong, forcing overt movement that violates Procrastinate. A look at cases suggests that the [\pm strong] dimension is narrowly restricted, perhaps to something like the set of options (1).

(1) If F is strong, then F is a feature of a nonsubstantive category and F is checked by a categorial feature. ... the Extended Projection Principle (EPP) plausibly reduces to a strong D-feature of I, and overt *wh*-raising to a strong D-feature of C (assuming *wh*- to be a variant of D (Determiner))” p.232

(13) “A strong feature has two properties. First, it triggers an overt operation, before Spell-Out. Second, it induces cyclicity: a strong feature cannot be “passed” by α that would satisfy it, and later checked by β ; that would permit Relativized Minimality violations (Wh-Island, superraising). In chapter 3 the pre-Spell-Out property was stated in terms of convergence at PF (a strong feature crashes at PF and therefore must be removed before Spell-Out), but that formulation was based on a stipulation that we have now dropped: that lexical access takes place before Spell-Out. The cyclic property was left only partially resolved in chapter 3 (and in Chomsky 1994a).” p.233

<<A deduction of cyclicity, largely redundant with the extension condition.>>

(14) “Apart from its problems and limitations, formulation of strength in terms of PF convergence is a restatement of the basic property, not a true explanation. In fact, there seems to be no way to improve upon the bare statement of the properties of strength. Suppose, then, that we put an end to evasion and simply define a strong feature as one that a derivation “cannot tolerate”: a derivation $D \rightarrow \Sigma$ is canceled if Σ contains a strong feature, in a sense we must make precise. A strong feature thus triggers a rule that eliminates it: [strength] is associated with a pair of operations, one that introduces it into the derivation (actually, a combination of Select and Merge), a second that (quickly) eliminates it.

<<Juan Uriagereka elegantly called this the ‘virus theory’ of strong features.>>

Cyclicity follows at once. We also virtually derive the conclusion that a strong feature triggers an *overt* operation to eliminate it by checking. This conclusion follows with a single exception: covert merger (at the root) of a lexical item that has a strong feature but no phonological features—an option noted earlier, to which we return.” p.233

<<Note that covert movement is driven only by weak features, so cyclicity would not be enforced: covert movement can be counter-cyclic.>>

(15) “We have to determine in what precise sense a strong feature cannot be included within a legitimate derivation. The intuitive idea is that the strong feature merged at the root must

be eliminated before it becomes part of a larger structure by further operations... the descriptive property of strength is (3). Suppose that the derivation D has formed Σ containing α with a strong feature F. Then
 (3) D is canceled if α is in a category not headed by α
 ... Note that this is not a principle governing strength but a descriptive observation about it..." p.234

Last Resort

- (16) “While Merge is costless for principled reasons, movement is not: the operation takes place only when forced (Last Resort); and it is overt, violating Procrastinate, only when that is required for convergence. If α has a strong feature F, it triggers an operation OP that checks F before the formation of a larger category that is not a projection of α . The operation OP may be Merge or Move.” p.235
- (17) “A ... requirement is that Move must meet the Last Resort condition on movement, which expresses the idea that Move is driven by feature checking, a morphological property.” p.253

More on economy comparison

- (18) “It is meaningless to ask whether the conditions that constitute the definition of Move can be "overridden" for convergence, or to ask how economy considerations apply to them. That is true whatever the proper conditions turn out to be. However formulated, these conditions are part of the definition of the algorithm C_{HL} . Violating them would be on a par with making an illegitimate move in a game of chess or adding a line illegitimately to a proof. In such cases further questions about the object being constructed (convergence, economy, shortest game or proof, etc.) do not arise. If the proper conditions are C-Command, uniformity, and Last Resort, then there is no meaningful question about the effects of violating these conditions (or whatever others may be introduced).” pp.253-4

Last Resort, Greed, and the nature of Move

- (19) “Consider three interpretations of Last Resort, adapted from the literature.
 (20) α can target K only if
 a. a feature of α is checked by the operation
 b. a feature of either α or K is checked by the operation
 c. the operation is a necessary step toward some later operation in which a feature of a will be checked” pp.256-7
 <<(20c) was motivated by successive cyclic movement, especially A-movement, since the intermediate landing sites don't satisfy any requirements of the moving DP.>>
- (20) “Let us ... consider a narrower conception that eliminates the whole range of options permitted by interpretation (20c) of Last Resort, thereby avoiding these questions entirely.

So far I have kept to the standard assumption that the operation Move selects α and raises it, targeting K, where α and K are categories constructed from one or more lexical items. But on general minimalist assumptions, that is an unnatural interpretation of the operation. The underlying intuitive idea is that the operation Move is driven by morphological considerations: the requirement that some feature F must be checked. The minimal operation, then, should raise just the feature F: we should restrict α in the operation Move to lexical features.” p.262

- (21) “One question arises at once: when F is raised to target K, why does F not raise alone to form $\{y, \{F, K\}\}$? Suppose that the subject raises to [Spec, IP]. The simplest assumption would be that only the formal features of the head involved in feature checking raise to this position, leaving the rest of the DP unaffected. Why is this not the case? The answer should lie in a natural economy condition.
 (26) F carries along just enough material for convergence.
 ... bare output conditions should determine just what is carried along, if anything, when F is raised.” p.262
- (22) “For the most part-perhaps completely-it is properties of the phonological component that require such pied-piping. Isolated features and other scattered parts of words may not be subject to its rules, in which case the derivation is canceled; or the derivation might proceed to PF with elements that are "unpronounceable," violating FI.” pp.262-3
- (23) “Just how broadly considerations of PF convergence might extend is unclear, pending better understanding of morphology and the internal structure of phrases. Note that such considerations could permit raising without pied-piping even overtly, depending on morphological structure, as in the theory of overt raising of empty operators in Japanese developed by Watanabe (1992).” p.264
 <<Ellipsis, understood as deletion, could provide other instances.>>
- (24) “... if pied-piping is forced by the need to satisfy some principle P, we conclude that violation of P causes the derivation to crash so that it does not bar less economical derivations without [sic] pied-piping – for example, the principle P that sometimes bars preposition stranding.” p.264
- (25) “When the feature F of the lexical item LI raises without pied-piping of LI or any larger category α , as always in covert raising, does it literally raise alone or does it automatically take other formal features along with it? There are strong empirical reasons for assuming that Move F automatically carries along FF(LI), the set of formal features of LI. We therefore understand the operation Move F in accord with (28), where FF[F] is FF(LI), F a feature of the lexical item LI. (28) Move F "carries along" FF[F]. This much pied-piping is automatic, reflecting the fact that Move relates to checking of formal features. Broader pied-piping is as required for convergence-"extraneous," insofar as PF convergence is the driving factor, which we tentatively assume to mean "always."” p.265

- (26) "... only convergent derivations are compared for economy ... the admissible derivations D_A are a subset of the convergent ones D_C . Thus, raising without pied-piping is more "economical" in some natural sense, but that is irrelevant if the derivation does not converge."
- (27) "We are now tentatively assuming that if all features of some category α have been checked, then α is inaccessible to movement, whether it is a head or some projection. But if some feature F is as yet unchecked, α is free to move. Economy conditions exclude "extra" moves and anything more than the minimal pied-piping required for convergence. In covert movement, features raise alone. Procrastinate expresses the preference for the covert option." p.266
 <<This will be a residue of the original Greed.>>
- (28) "Among the matters still to be clarified is the status of the MLC. The preferred conclusion would be that the MLC is part of the definition of Move: Move F must observe this condition, making the "shortest move" permissible. If that can be established, it will sharply reduce the computational complexity of determining whether a particular operation OP in the course of a derivation is legitimate. In contrast, if the MLC is an economy condition selecting among derivations, OP will be permissible only if no other convergent derivation has shorter links. It is hard to see even how to formulate such a condition, let alone apply it in some computationally feasible way; for example, how do we compare derivations with shorter links in different places? But the question does not arise if violation of the MLC is not a legitimate move in the first place. Following the usual minimalist intuition, let us assume that violation of the MLC is an illegitimate move ..." pp.267-8

More on feature types

- (29) "Evidently, certain features of $FF(LI)$ enter into interpretation at LF while others are uninterpretable and must be eliminated for convergence. We therefore have a crucial distinction \pm interpretable. Among the Interpretable features are categorial features and the ϕ -features of nominals" p.277