

Recent Minimalism: Chomsky (2000, 2001)

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Minimalist Inquiries

(1) Caveat (apply profusely): The proposals are very tentative. “Minimalism” is still a program, not a theory. Everything we know about language argues against it. The questions that we pose are probably premature, if not meaningless. In short, this is all crazy, so let’s do it.

(2) The minimalist question: How close does language come to optimal design? To what extent minimal design specifications derive the properties of UG?

“Therapeutic” value: Minimalist methodology urges you to get rid of “technological” solutions, unnatural concepts and stipulations (examples: goovernment, Agr projections).

But remember: “Caution is in order in appealing to such considerations. Given some empirically supported conclusion, it is often possible to construct plausible conceptual grounds for it, and for alternatives”.

(3) Perfect design is *not* perfect usability. Language may approach a perfect design, in that its properties are almost fully reducible to interface conditions. But actual expressions may often be unusable, due to memory and parsing limitations (garden path, central embedding). So the notion that language is “almost perfect” in some biological sense is quite different from the traditional functionalist mantra that language is well-designed for communication.

(4) The strongest minimalist thesis: Language is an optimal solution to legibility conditions.

If true, then just by knowing the legibility conditions, and what an optimal solution to them would look like, we would be able to derive all linguistic facts (acquisition, processing, neurology, etc.). “The proposal is odd... evidence does not come with a mark: ‘I do or do not bear on reality’”.

How do we know what the legibility conditions are? We must understand the external systems. But they “are not well understood. Progress in understanding them goes hand in hand with progress in discovering the language systems that interact with them”.

Derivationalism

- (5) Strong derivational approach: There is no final representation, everything is computed dynamically (Epstein et. al.).

Weak derivational approach: Some operations are cyclic, but others apply at the interface to the entire expression (Chomsky).

Representational approach: No derivations, all conditions apply to LF/PF representations (Brody).

Chomsky: It’s not clear that the issue is real. But let’s suppose it is. On the derivational approach, we might expect to discover principles of “least effort”, eliminating superfluous elements/operations, licensing only non-vacuous operations; local search for computation (locality of movement); and “local determinability” (no look ahead).

- (6) Actual complexity is *not* mathematical complexity. “Suppose automobiles lacked fuel storage, so that each one had to carry along a petroleum-processing plant. That would add only bounded “complexity”, but would be considered rather poor design. Something similar might well be true for language”.

General language design

- (7) **F** – the universal set of linguistic features
[F] – the subset of **F** operative in a language L.
Lex – the lexicon of L, assembled from [F]
LA – the lexical array used in a given derivation

Assumptions: L makes a one-time choice of [F] from **F**, a one-time assembly of Lex from [F], and a one-time choice of LA from Lex (recall the fuel plant). Moreover, derivations have no access to “unpackaged” free-floating features.

Operations

- (8) *Merge* (indispensable in any symbolic system): $\text{Merge}(\alpha, \beta) \rightarrow K(\alpha, \beta)$
Agree (specific to language) between a lexical item and a feature in its domain.
Move = Agree + Pied-piping + Merge (pied piping determines what projection of the agreeing feature is actually moved).

Economy: Agree preempts Move (replacing Procrastinate).

Core functional categories: v, T, C

- (9) **v**: expresses transitivity, selects V, has ϕ -features (object agreement), selects external argument, has optional EPP feature (second Merge) for object shift.

T: expresses tense/event structure, has ϕ -features (subject agreement), obligatory EPP feature. If selected by C, it has a full set of ϕ -features, whether expressed (finite) or not (control). If selected by V (raising/ECM), it has only a subset of ϕ -features (only [person]?), hence defective.

C: expresses force/mood, has ϕ -features, optional EPP feature (for *wh*-phrases)

- (10) $[_{VP} XP [_{VP} \text{Subj} [_{v'} v [_{VP} V \text{Obj}]]]]$

XP is the object-shift position. It can't be filled by Merge of an argument, because...

- (11) *Merge-Theta*

Pure Merge in θ -position is required of and restricted to argument.

Consequence: No movement to a θ -position. Chomsky hints that this is implicit in Hale & Keyser's view of argument structure, but it's not clear how.

- (12) $[_{TP} T [_{VP} XP [_{VP} \text{Subj} [_{v'} v [_{VP} V \text{Obj}]]]]$

The object may raise to the XP position (as in Icelandic) or not; the subject may raise to [Spec,TP] or not; if not, an expletive is merged in [Spec,TP].

- (13) a. [CP C [TP T [VP *likely* [TP T_{def} [VP XP [VP Subj [v' v [VP V Obj]]]]]]]]]
 There is likely to be a proof discovered.

there raises from the lower [Spec, T_{def}] to the higher [Spec, T].

- b. [CP C [TP T [VP Subj [VP *expect* [TP T_{def} [VP XP [VP Subj [v' v [VP V Obj]]]]]]]]]
 I expected there to be a proof discovered.

there can't raise from the lower [Spec, T_{def}] to the higher [Spec, T], since the matrix external argument intervenes in [Spec, vP] (MLC).

Merge over Move

- (14) a. * There is likely [a proof to be dicovered].
 b. There_i is likely [t_i to be a proof discovered].
 c. A proof_i is likely [t_i to be a proof discovered].
 d. [TP T_{def} [be a proof dicovered]]

At stage (d), either Move of *a proof* or Merge of *there* can satisfy the EPP feature of T_{def}. Both involve Agree, but Move also involves “pied-piping”. Merge wins by economy when *there* is in the numeration.

- e. John expected [a proof to be discovered].
 f. John expected [there to be a proof discovered].
 g. * John_i expected [t_i to be a proof discovered].

At stage (d), either Move of *a proof* or Merge of *there* can satisfy the EPP feature of T_{def}. Both are possible since *there* need not be in the numeration. (g) is ruled out not by economy, but by *Merge-Theta* (11).

Control CPs

- (15) Chomsky: Like finite CPs and unlike raising/ECM TPs, control CPs assign case to their subject, can sometimes appear as root expressions, and enjoy “distributional freedom”. Therefore: Control T is nondefective, control C introduces a phase.

(16) Note: Chomsky relies on an old observation by Rizzi:

- a. What did John promise? To help Mary.
- b. * What did John seem? To be angry.

But while it's true that no raising complement can be "separated", it is very *not* true that every control complement can:

- c. * What did John persuade Mary? To help him.
- d. * What did John condescend? To help Mary.

In fact, the bad cases are ruled out because *what* has no case. If the control verb has no accusative case to assign to the infinitive – either because it is already assigned, or because the verb is unaccusative – a separated infinitive is ruled out.

(17) "Merge over Move" predicts, incorrectly, that *proofs* can't be raised in (a), since *there* could be merged from the numeration.

- a. There is a possibility [that proofs will be discovered].

Solution: The numeration is also cyclic, broken into separate *phases*. When the embedded T is reached, there is not yet in the numeration, so movement isn't prevented. That's more evidence for constraints on "operative complexity".

What's a phase?

(18) *Phase* – a propositional unit, vP or CP. Actually, Chomsky restricts phases to units headed by a core functional category with ϕ -features. So phases are CPs, finite or control, and transitive vPs. TPs and unaccusative/passive vPs/VPs are not phases.

(19) *Phase Impenetrability Condition* (PIC)

In a phase α with a head H, the domain of H is not accessible to operations outside α , only H and its edge (=specifiers/adjuncts) are accessible to such operations.

Note: PIC derives Subjacency in a strong form. Movement must proceed successive cyclically, leaving a copy at the edge of every intervening transitive vP or CP.

⇒ By the end of a phase, all the uninterpretable features in its domain must be deleted (because later operations won't have a chance to do so).

Relations and Chains

- (20) Imperfection in language design could be i) illusory, ii) real and irreducible, iii) real but reducible to some “optimal solution”.
- (21) Illusory imperfections: DS, SS, government, indices, X-bar levels, traces, λ -operators. Let's assume none of this exists in derivations or LF/PF representations.
- (22) Reducible imperfections
- a. A chain is a set of *occurrences* of a single item. Occurrence of α is defined as the sister of α . All properties of chains follow from independent principles (so – no Chain Condition).
 - b. Feature chains *don't* exist (how can we define sisterhood or c-command for features? Too much of a headache).
 - c. Merge provides two relations: sisterhood (between the objects merged) and immediate containment (between the the output and the inputs). The transitive closure of “immediately contain” is “contain”; the transitive closure of “sister” is “identity”; and “sister” of “contain” is “c-command”.
 - d. Modified lexical items (heads with deleted features) preserve their configurational relations.
 - e. Adjunction? L-marking?

Irreducible imperfections

- (23) *The Inclusiveness Condition*
No new features are introduced by C_{HL} .

The phonological component massively violates inclusiveness (by adding prosodic structure, narrow phonetics). Perhaps the source of these imperfections (the sensorimotor system) and the abundance of evidence allows this situation.

- (24) Inclusiveness + FI: “Inclusiveness holds of narrow syntax, and each feature has either a PF or an LF interpretation”

The most interesting reducible imperfection

- (25) a. Lexical items have uninterpretable features.
b. Language displays “dislocation”.

Perhaps dislocation is in fact required by the thought system. That system requires dissociation of argument-structure (θ -roles) from information-structure (topic, focus). If this is a bare output condition, then (25b) – not found in any other symbolic system – is not an imperfection. We might take then (25a) to be the *mechanism* by which (25b) is realized, and therefore, also not an imperfection.

The mechanism of dislocation

- (26) [_{TP} T [be elected an unpopular candidate]

The *probe* T has uninterpretable ϕ -features (+case) and selectional EPP feature. The probe looks for a matching *goal*, in this case *an unpopular candidate*. The goal has interpretable ϕ -features and uninterpretable case.

Structural case is what makes the goal active, by enabling the selection of the pied-piped category to be merged. \Rightarrow Case-checking renders a DP inactive, hence inaccessible to Agree/Move. Structural case is lexically valued on T, syntactically valued on DP; the reverse holds for ϕ -features.

- (27) Conditions on Agree

- a. Probe-goal matching (\Rightarrow no V/N/D-features in checking).
b. The goal is active.
c. The goal is in the domain of the probe (c-command).
d. There is no closer goal (up to equi-distance).

- (28) [_{TP} T [_{PartP} Participle [_{VP} V DP]]]

The participle lacks [person], but can still Agree with DP on [number,gender]. DP's case is still active, its ϕ -features are interpretable and not deleted, so it can further Agree with T. This gives rise to French participle agreement.

(29) $[_{TP} T [_{VP} seem [_{TP} T_{def} [_{VP} DP v [_{VP} V]]]]$

T_{def} must have some minimal uninterpretable feature; let's say [person]. That's the probe for successive cyclic movement through this position, or expletive merge (so *there* also has uninterpretable [person]).

(30) Consequences

a. Uninterpretable features can only delete in “one fell swoop”. So whenever X and Y Agree, and X has a subset of the uninterpretable features of Y, X's features delete, but Y's features survive.

⇒ i) an expletive can't delete the features of nondefective T, but its own [person] feature is deleted. ii) T_{def} allows, but standard finite/control T doesn't allow, successive cyclic movement.

b. Dissociation of checking from dislocation: Agree and movement to Spec are independent (cf. Icelandic quirky subject satisfying EPP together with long-distance nominative satisfying Agree). Therefore, the notion of checking domain is eliminated (the only domain relevant for Agree is defined in (27)).

c. More generally – the Spec-head relation has no special status.

Note: Still, it is universally true that agreement+movement is richer than agreement in-situ (French participial agreement, Arabic VSO/SVO agreement, etc.) That's a mystery under the radical dissociation between Agree and EPP (recognized in DbP, fn. 39).

(31) **On Greed:** The original Greed of Chomsky (1993) was motivated by features of the goal. It also involved look-ahead. Lasnik's “Enlightened self-interest” allowed Greed to be motivated by either goal or probe. The current version holds that features of the probe must be deleted – “Suicidal Greed”.

- (32) **On Case:** Structural case is “demoted in significance”. It’s a reflex of agreement, not the trigger, serving to activate the goal. [note: one can sense some uneasiness here; the picture is bound to change].

Defective intervention effects (DIE)

- (33) Wh-island

- a. * $[_{CP} C_{[Q]} \dots [_{CP} wh^1_{[Q,WH]} \dots wh^2_{[Q,WH]}]]$

[Q] is uninterpretable on C, interpretable on *wh*-phrases, [WH] is uninterpretable on *wh*-phrases, making them active (like case in A-movement). wh^1 in (a) has checked off its [WH] feature, so it’s inactive; but it still blocks Agree between the matrix C and wh^2 .

Note: It’s not clear why both [Q] and [WH] are needed (the notion of “active” becomes a complication). More puzzling – doesn’t the failure of long-distance Agree in (a) simply follow from the PIC?

- (34) A-movement / Expletive-Associate

- a. * [John₁ to seem [**t₁** is intelligent]] would be surprising.
b. * We hoped [PRO₁ to be decided [**t₁** to be killed at dawn]].
c. * This book₁ seem [t₁ to read₂ [**t₁** never [any students t₂]].

(a) involves raising out of a finite clause into an infinitive. (b) involves raising of PRO from one control complement to another. (c) involves OS feeding movement to subject position and then raising.

In all these cases, the boldfaced position is inactive, case being checked there. So it can’t move to (or agree with) the higher probe.

Alternative explanations: (a) violates the requirement that clausal subjects (with lexical subjects) be introduced by an overt C; (b) could be ruled out by whatever blockes reflexive readings for passive (PRO is coindexed with the implicit decider).

- (35) a. * There *seem* [several people are *friends of yours*].
b. * There *were* decided [PRO to stay with *friends*].

- c. * There *seem* [that it was told *friends* [that it's raining]].

The Agree relation is blocked by the embedded subject, though it's inactive (DIE). Notice again, Chomsky assumes that the PIC doesn't apply here.

- (36) Intervenors must be complete chains.

Icelandic

- a. me.DAT₁ *thought*.pl [t₁ [*they*.NOM.pl be industrious]].
b. * me.DAT₁ *seem*.pl [t₁ [*John*.DAT to like horses.NOM.pl]].

t₁ doesn't block agreement with the embedded nominative, because it's only part of a chain; but *John*.DAT does block it since it's the entire chain.

- (37) DIE argue against Move as distinct from Agree+Merge. The closest target that can check of the case feature of the associate is the matrix T; the fact that it's too far can only be accounted for by an Agree-based theory.

Cyclic Spellout

- (38) a. Deleted features persist to the end of the phase.
b. Every phase is a spellout cycle.
c. The former distinctions between overt, covert, and phonological cycles – collapse. There is a single cycle in the grammar.
d. Apparent countercyclic covert movement is cyclic Agree.

Note: Covert movement is needed besides Agree, to account for QR, ACD, etc.

- (39) Cyclicity follows from “minimal search”; operations can only access full syntactic objects, attending to the “needs” of their heads.

Derivation by Phase

- (40) To make the distinction between interpretable and uninterpretable features visible throughout the derivation, we assume that uninterpretable features enter the derivation unvalued. They are valued by Agree, deleted from narrow syntax but available to spellout.

a. [Susan T_{comp} seems [TP ~~Susan~~ T_{def} to be ~~Susan~~ sleepy]]

↑ | ↑ |

Move (1): T_{def} has uninterpretable [person], *Susan* has Case, both active: they Agree.
 [3rd person] of *Susan* values [person] of T_{def}.
Susan's ϕ -features are complete, so T_{def}'s features delete.
 T_{def}'s features are incomplete, so *Susan*'s Case feature remains.
 EPP forces movement to [Spec,TP].

Move (2): T_{comp} has uninterpretable ϕ -features, *Susan* has Case, both active: they Agree.
 [3rd person,+Sg,+Fem] of *Susan* values [person,number,gender] of T_{comp}.
 Both sets of ϕ -features are complete, so all uninterpretable features delete.

Note: The status of Case is unclear. It makes a DP “active”. Chomsky maintains that T/v have no Case feature, but it’s assigned a value under agreement. What’s the source of the value (Nom, Acc) if not T/v?

Cyclic spellout

(41) Cyclic spellout applies to strong phases (transitive vP, notated v*P, or CP). Earlier phases can be “forgotten”, being inaccessible to syntax (because of PIC) and phonology (because of cyclic spellout).

(42) “Simplest assumption”: Heads of chains are pronounced.
Note: That’s probably too simplistic. First, there is covert movement (not Agree); second, there are cases of multiple pronunciation of chain positions.

Generalizing from spellout...

(43) A strong phase is interpreted/evaluated at the next (higher) strong phase.
Note: Chomsky probably means that the head/edge of a phase are interpreted/evaluated at the next level. As regards LF, however, long-distance variable binding must be able to look at units larger than phases:

a. Every boy₁ heard the rumor that his₁ mother came from Mars.

Dividing labor between PIC and “Inactivity”

(44) PIC of MIF is weakened in DbP to strong phases only.

If HP is a strong phase and ZP the minimal strong phase above it, then the domain of H is not accessible to operations at ZP; only H and its edge are.

(45) Consequences

- a. $[_{CP} C [_{TP} T [_{v^*P} v^* [_{VP} V DP]]]]$
- b. $[_{CP} C [_{TP} T [_{v^*P} v^* [_{TP} \dots DP \dots]]]]$
- c. $[_{CP} C [_{TP} T [_{vP} v [_{VP} V [_{CP} \dots DP \dots]]]]]]$

(a) and (b) represent local and long-distance agreement with a nominative DP (possibly part of Move). (c) represents agreement across CP. All cases are licensed by the PIC, since the domain of a strong phase (v^*P or CP) is accessible to all probes up to the next higher strong phase. If ungrammatical, these cases are ruled out only because DP, or an intervener, is inactive. That clarifies (34)-(35) above, though not the *wh*-island (33).

- d. * There *seem* [that it was told *friends* [that it's raining]].
- e. * me.DAT₁ *seem.pl* [t₁ [John.DAT to like horses.NOM.pl]]. *Icelandish*

(46) “Maximize matching effects”.

This principle has the effect of Earliness, or strong features. Feature checking and deletion must proceed in maximal chunks.

- a. There is likely to arrive a man.
- b. * A man is likely there to arrive.

When *there* is in the embedded [Spec,TP], Agree ($T_{matrix}, there$) takes place, activated by [person], before Agree ($T_{matrix}, a man$). Maximize Match requires EPP-checking as well, so *there* moves, blocking (b).

Note: Does DP have an EPP feature? If not, how is Match relevant? Further, (b) could be ruled out if raising/ECM clauses lack EPP (see “idea” in **(Error! Bookmark not defined.)**).

More Icelandic

- (47) a. There T⁰ *seem.pl* to have been caught.NOM.pl several fish.NOM.pl.

- b. John v^0 expects.sg there to have been caught.ACC several fish.ACC.

The matrix T/v agrees in ϕ -features and Case with *several fish*; the participle *caught* agrees in [number,gender,Case].

The single strong phase is the matrix CP, hence all checked features persist until the entire sentence is finished.

For (a): Prt=*caught*; DP=*several fish*;

- i. Agree (Prt,DP)
[person,gender] of Prt valued and deleted; Case of neither is valued.
- ii. Agree (T,Prt)
Case of Prt is still active; it is valued (Nom) and deleted; ϕ -features of T unvalued because Prt is ϕ -incomplete.
- iii. Agree (T,DP)
Case of DP is valued and deleted; ϕ -features of T valued and deleted. Prt does not intervene because it's ϕ -incomplete.

Real English facts

(5) Puzzling word orders

- a. *There was placed a large book on the table.
- b. There was placed on the table a large book.
- c. There was a large book placed on the table.

In most Germanic languages – the facts are reversed.

(48) *English “Thematization/Extraction” (Th/Ex)*

At PF, move DO to the left (or right) edge of vP.

Evidence that Th/Ex is phonological

- (49) Th/Ex has no semantic effect (unlike OS), e.g., specificity.
- (50) The NP that undergoes Th/Ex, whether to the left or right, is inaccessible to syntactic operations, like *wh*-movement.

- a. * How many packages did there arrive in the mail?
- b. * What did there arrive in the mail [several packages of ___] ?
- c. *What are there [books about ___] being sold (in Boston these days)?

This is *not* a property of expletive constructions generally:

- d. How many packages are there in the room?
- e. What are there [several packages of ___] in the room?

(51) Still, the trace of the associate *is* visible to Agree (getting Nom case) and to interpretive conditions, like binding. Exactly what part of Move is incompatible with the trace of Th/Ex?

- a. Not Merge, since other null elements (pro, PRO) can Merge.
- b. Not Agree, since the associate agrees with T.
- c. \Rightarrow A trace can't pied-pipe (pro/PRO are heads, need not pied-pipe).
- d. Further, perhaps an inactive trace resists Match, explaining (36).

Chomsky notes that the dependence of pied-piping (hence, Move) on the presence of phonological features is “suboptimal”; narrow syntax shouldn't care about these matters (the issue goes back to the status of special conditions on ec's).

Object Shift

(52) Assuming PIC, *wh*-movement of the object must proceed through the OS position even in English, even if the object can surface in that position only in Scandinavian languages:

- a. Guess $[_{CP} \text{what}_1 [_{TP} \text{John}_2 T [_{VP} t_1 [_{VP} t_2 \text{read } t_1]$.

(53) Why is OS barred in English? Possibly, the shifted object would produce a defective intervention effect between T and Subj. But why should this be restricted to Move, and not Agree (the latter obtaining in (52a)? Moreover, in Icelandic DAT-V-NOM constructions, the dative subject raises past the shifted object that agrees with T.

\Rightarrow OS is only allowed in English if followed by further movement of the object. Or, Agree (T,Subj) depends on the outer Spec,vP being empty. **Countercyclic!!**

Holmberg's Generalization

- (54) OS can't apply across a phonologically visible category – V, particle, indirect object – except adjuncts.

Holmberg's account assumes that OS is triggered by semantic properties of the object (specificity, old information; Chomsky calls this "Int") but conditioned by phonological edge. This kind of interaction runs against the spirit of DbP, and also doesn't extend to "invisible" OS, as in (52a).

(55) Chomsky's account

- a. UG: v^* is assigned an EPP feature (allowing OS) only if that has a semantic effect on the outcome (optional rules are outcome-dependent).
- b. UG: The EPP position of v^* is assigned Int.
- c. In OS languages: At the phonological border of v^*P , XP is assigned Int' (the opposite of Int, namely, new information).

(56) *English*

- a. Guess [_{CP} what₁ [_{TP} John₂ T [_{VP} t₁ [_{VP} t₂ read t₁].
- b. * They had it₁ never [_{v*P} t_{have} t₁].

Icelandic

- c. They read it₁ never [_{v*P} t_{read} t₁].
- d. * They read never [_{v*P} read it].
- e. * They have it₁ never [_{v*P} read t₁].

- (57)
- a. *Wh*-question has a semantic effect, so v^* may be assigned EPP, allowing "invisible" OS in all languages, whether or not Obj is at the phonological border of v^*P ; (56a).
 - b. In non-OS languages, Int is available in-situ for all objects; OS isn't necessary to obtain this reading, hence it's blocked (no EPP-assignment to v^*); (56b).
 - c. In OS languages, Int is *unavailable* for objects at the phonological border of v^*P ; OS has a semantic effect, so it's allowed; (56c).
 - d. In OS languages, objects at the phonological border of v^*P are assigned Int'; if the object is intrinsically specific, the result is deviant; (56d).

- e. In OS languages, Int is available in-situ for objects *not* at the phonological border of v*P; by the reasoning in (b), they may not shift; (56e).
- (58) Note: Countercyclicity is not entirely eliminated. Evaluation applies at the next strong phase; so whether or not Obj is at the phonological border of v*P is known only when the CP phase is reached (e.g., V-topicalization).
- (59) OV languages (German, Dutch): They are OS languages, but (55c) always applies, hence OS (scrambling) doesn't depend on V-raising.
Romance: Non-OS languages.
- (60) A problem: OS applies in (a), although the in-situ subject separates the (base) object from the phonological border of v*P:
- a. there read it_i never [_{v*P} any students t_{read} t_i].

Solution: The principle "Something must escape a transitive v*P" licenses an EPP-feature on v*.

Note: Perhaps the subject has raised outside v*P.

More phonological movements

- (61) a. Th/Ex.
b. Disl.
c. Head movement.
- (62) Oddities of head movement
- a. Why "head"? Why V-to-T and not VP-to-T? Why T-to-C and not TP-to-C?
b. It's countercyclic.
c. The head doesn't c-command the tail (on the simplest assumptions).
d. It's unclear how to identify occurrences of the head (in a chain).
e. It's not iterable (successive-cyclic).
f. It's intact in aphasics (unlike A-chains).

Chomsky: All of these properties naturally fall out if head movement is phonological and applies to affixal elements.