

*Minimalist Program and Ease of Language Acquisition: Investigating Chomsky's
Uniformity, Simplicity and Economy*

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Abstract

The minimalist program is in part a reaction to some problems that have afflicted GB theory. A theory of grammar introduced by Chomsky in 1995 as an advance on government/binding theory while remaining within the general paradigm of the principle and parameters model of universal grammar. The cornerstone of the theory is that grammars should make use of the minimal theoretical apparatus necessary to provide a characterization of linguistic phenomena that meets the criterion of descriptive adequacy. This goal is motivated in part by the desire to minimize the acquisition burden faced by children and account for the fact that children will acquire any language they are exposed to. MP consists of three important characteristics: economy, simplicity and uniformity. The present study tries to investigate three important characteristics of minimalist program, i.e. economy, uniformity and simplicity by analyzing them from minimalist point of view and regarding different principles which help in proving them. Then it has been tried to explain the relationship between language acquisition, one of the most important principles in the realm of FLA and SLA and the above mentioned characteristics of minimalism.

Keywords: minimalism, economy, uniformity, simplicity, language acquisition

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1. Introduction

In linguistics, the minimalist program (MP) is a major line of inquiry that has been developing inside generative grammar since the early 1990s, starting with a 1993 paper by Noam Chomsky.

The Minimalist program, a development of earlier work in transformational generative grammar, proposes that the computational system central to human language is a 'perfect' solution to the task of relating sound and meaning. Recent research has investigated the complexities evident in earlier models and attempted to eliminate them, or to show how they are only apparent, following from deeper but simpler properties. Examples of this include the reduction of the number of linguistic levels of representation in the model, and the deduction of constraints on syntactic derivations from general considerations of economy and computational simplicity.

On the basis of Sadighi (2008), MP grew out of the efforts of the researchers in the Principles and Parameters framework. In the minimalist program it has been tried to simplify the theory of the syntax of natural language to the great possible extent. The idea of the program is to develop a language in an economical, simplified and uniform manner.

Different books and articles written by researchers such as Chomsky (1993, 1995), Radford (2004, 2009), Cook & Newson (1998), Rizzi (1999, 1994) and et.al in the realm of minimalism tried to represent language on the basis of three important points. They are economy, uniformity and simplicity. All of which will be discussed at length as follows.

2. Economy principle

From the very beginning of the minimalist program, economy was recognized as a central feature. Prefigured in Chomsky (1991), it featured prominently in Chomsky (1993) and (1995). In other words, MP is characterized by principle of economy of representation.

This requires that representation in a syntactic structure should contain only the required elements. Essentially, economy principles require comparison of the number of steps in a derivation (economy of derivation) or number of symbols in a representation (economy of representation). The basic intuition behind economy principles is that, all else equal, one should minimize the number of operations and symbols necessary for convergence (Boex, 2006). In minimalism, economy principle states that syntactic representations should contain as few constituents as possible and derivations should posit as few grammatical operations as possible (Radford, 2009).

For example:

speaker a: What has the chairman resigned from?

speaker b: *The board/From the board*

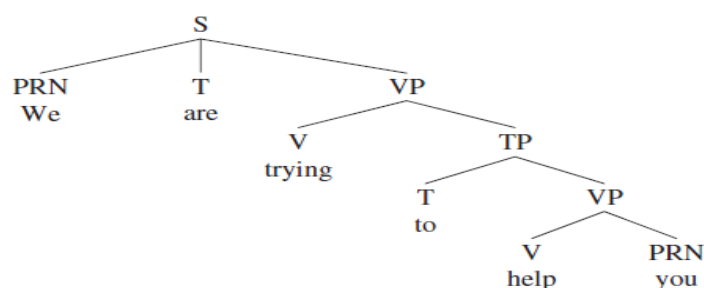
Given the conversational maxim ‘Be concise!’ postulated by Grice (1975), the shorter response *the board* will generally be preferred to the longer response *from the board* for economy reasons.

Following Chomsky and Lasnik’s reinterpretation of Rizzi’s work, several principles of grammar were reinterpreted in terms of economy (Boex, 2006). The following principles can shed light on economy as the cornerstone of MP.

2.1 Binariness

Binariness is the simplest non-trivial combination of elements and syntax and is fundamentally economical. Chomsky (2005) claimed that binary branching trees are computationally more efficient/ economical than other kinds of representations. In fact, in the context of binary branching, several rules are reduced to one and it can be claimed that reductionism is one of those things that can be attributed to economy (Boex, 2006).

Binariness states that every nonterminal node in a syntactic structure is binary branching. In other words, the Binariness Principle ensures that syntactic representations will have a binary architecture with each phrase consisting of just two constituents. For instance, in the following example, the S analysis in violates the Binariness Principle in that the S constituent *We are trying to help you* is not binary-branching but rather ternary-branching, because it branches into three immediate constituents, namely the PRN *we*, the T *are*, and the VP *trying to help you* (Radford, 2009).



2.2 Preposing Condition

Following the economy condition and considering that only a maximal projection can be preposed for highlighting purposes, so, the preposing condition can be put forth as follows:

When material is preposed in order to highlight it, what is preposed is the smallest possible maximal projection containing the highlighted material.

Example:

- (a) He definitely refused to go to the university
- (b) *Go to the university*, he definitely refused to
- (c) **To go to the university*, he definitely refused

So, if the semantic content of the VP *go to the university* wants to be highlighted, the VP *go to the university* rather than the TP *to go to the university* is preposed because the VP is smaller than the TP containing it.

2.3 Attract Smallest Condition/ASC

Attract Smallest Condition/ASC states that a Probe which attracts a particular type of goal attracts the smallest accessible string containing the relevant goal.

What ASC tells us is that we should first try moving the wh-item on its own, and then (if some constraint makes it inaccessible to movement) move the next smallest string containing it...and so on, until we find the smallest wh-goal which can be preposed without violating any constraint.

If C attracts the wh-word *what* to move to spec-CP on its own, we derive:

- a. [CP *what* [C will] [TP there [T will] [VP [V be] [QP [Q *what*] [FP new [F \emptyset] [N rules]]]]]]

But the resulting sentence **What will there be new rules?* is ungrammatical, because *what* is rendered inaccessible for solo wh-movement by the Chain Uniformity Condition (Chomsky 1995: 253) in which ‘A chain is [only well-formed if every copy in it is] uniform with regard to phrase structure status’.

This is because the resulting wh-chain *what...~~what~~* in (a) is of non-uniform status, in that the deleted lower copy ~~*what*~~ is a head Q/Quantifier which projects into a superordinate QP/Quantifier Phrase *what new \emptyset rules*, whereas the italicized higher copy *what* is not a head (i.e. does not project into an immediately superordinate QP) but rather is a maximal projection serving as the specifier of CP.

Because *what* is prevented by the Chain Uniformity Principle from moving on its own, we try preposing the next smallest string containing *what* (viz. *what new*), resulting in:

- b. [CP *what new* [C will] [TP there [T ~~will~~] [VP [V be] [QP [Q ~~what~~] [FP ~~new~~] [F \emptyset] [N rules]]]]]]

However, the resulting sentence **What new will there be rules?* is ungrammatical, because movement of the string *what new* violates a further universal principle (dating back to constraints on possible ‘syntactic objects’ in the days of X-bar Syntax), namely: Constituency Condition/CC that says Only a constituent which is a minimal or maximal projection can be the Goal for a Probe.

The reason why (b) is ungrammatical is that *what new* is a non-constituent string (i.e. a string which is not a constituent of the structure in 1), and hence not a minimal or maximal projection. By contrast, if the whole maximal (QP) projection *what new \emptyset rules* is fronted in (1), deriving (c) below:

- (c) [CP [QP [Q *what*] [FP new [F \emptyset] [N rules]]] [C will] [TP there [T will] [VP [V be] [QP [Q *what*] [FP new [F \emptyset] [N rules]]]]]]

There will be no violation of the Attract Smallest Condition (because we preposed the smallest accessible wh-goal), nor of the Chain Uniformity Condition (because the higher and lower links of the wh-chain have a uniform structure), nor of the Constituency Condition (because the fronted string what new \emptyset rules is a QP and hence a maximal projection) (Radford and Yokota, 2011).

Therefore, it should be noted that ASC can be subsumed under a more general condition which Chomsky sketches in the Economy Condition that derivations and representations are required to be minimal, with no superfluous steps in derivations and no superfluous symbols in representations. This amounts to requiring that structures (i.e. ‘representations’) be as simple (i.e. ‘minimal’) as possible, and that the syntactic operations involved in derivations should likewise be as simple as possible.

2.4 Locality Principle

- (a) He had said who would do what? (= echo question)
- (b) Who had he said would do what? (cf. He had said who would do what?)
- (c) *Who would he had said do what? (cf. He had said who would do what?)
- (d) *What had he said who would do? (cf. He had said who would do what?)
- (e) *What would he had said who do? (cf. He had said who would do what?)

By comparing the above sentences it can be understood that (b) involves preposing the first wh-word *who* and the first auxiliary *had*, and that this results in a grammatical sentence.

By contrast, (c) involves preposing the first wh-word *who* and the second auxiliary *would*; (d) involves preposing the second wh-word *what* and the first auxiliary *had*; and (e) involves preposing the second wh-word *what* and the second auxiliary *would*. The generalisation which emerges from the data in the above examples is that auxiliary inversion preposes the closest auxiliary *had* (i.e. the one nearest the beginning of the sentence in (a) and likewise wh-fronting preposes the closest wh-expression *who*.

The fact that two quite distinct movement operations (auxiliary inversion and wh-movement) are subject to the same locality condition (which requires preposing of the most local – i.e. closest – expression of the relevant type) suggests that one of the UG principles incorporated into the Language Faculty is a Locality Principle which states that grammatical operations are local.

In consequence of Locality Principle, auxiliary inversion preposes the closest auxiliary, and wh-movement preposes the closest wh-expression. Also, Locality Principle includes movement operations and other types of grammatical operation including agreement and case assignment as a universal grammar principle (Radford, 2009).

By assuming that abstract grammatical principles as a universal and part of people’s biological endowment, it can be naturally concluded that locality principle is biologically wired into the language faculty, and thus forms part of their genetic make-up (Radford, 2004). Also, Rizzi’s (1990) understanding of locality was the

principle within P&P that received an almost immediate minimalist formulation in terms of economy.

2.5 Relativised Minimality Condition/RMC

In the realm of syntax, if somebody tries to front an element X of type Y to a position Z, s/he cannot do this if there is an element W of type Y that is in between X and Z. This is the basic idea behind Rizzi's (1990) Relativized Minimality principle or Chomsky and Lasnik's variant in terms of Shortest Move. It accounts for why you must front the first auxiliary in an auxiliary sequence when you want to form questions.

- a. Has John seen it? Cf. John has seen it
- b. *Seen John has it?

It also accounts for why you must take the first object of a ditransitive clause when you passivize it:

- a. The boy was given the toy. Cf. Somebody gave the boy the toy
- b. *The toy was given the boy


Interestingly, it is fine to say *The toy was given to the boy* because this sentence starts off as *Somebody gave the toy to the boy*, where *toy* is the first object in the sequence. Finally, Rizzi's principle accounts for why a sentence like *Somebody bought something* can be converted to a question like *Who bought what?*, but not into **What did who buy?*

In all these examples, you have the choice between two auxiliaries, two objects, or two wh-words, and in each case you front the 'first' one (or the one closer to the target position; recall that by 'first' I really mean 'higher', as syntactic processes rely on hierarchical structure, not linear structure).

Relativised Minimality Condition/RMC devised by Rizzi states that a constituent X can only be affected (e.g. attracted) by the minimal (i.e. closest) constituent of the relevant type above it (i.e. c commanding X).

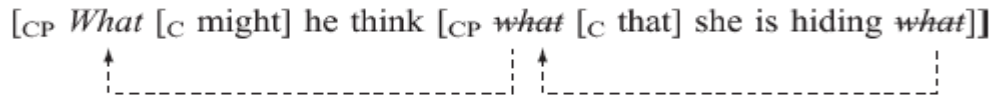
It follows from the RMC that a constituent undergoing wh-movement can only be attracted to become the specifier of the minimal/closest C-constituent above it. It also follows that a constituent undergoing head movement can only be attracted to adjoin to the minimal/closest head above it. So, long distance (single-step) wh-movement in the following sentence would violate RMC

[_{CP} *What* [_C *might*] he think [_{CP} [_C *that*] she is hiding *what*]]



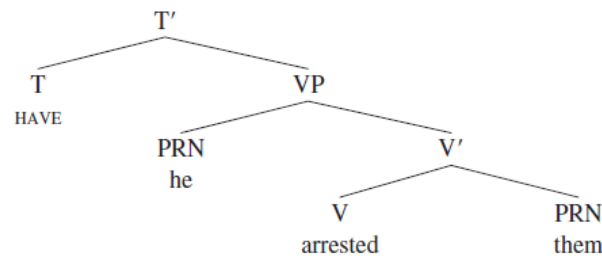
because *what* moves directly to become the specifier of the main clause C constituent containing *might*, and yet this is not the closest C constituent above the original copy of *what*. Since the closest C constituent above the position in which *what* originates is the embedded clause complementiser *that*, RMC requires *what* to become the

specifier of the embedded C constituent containing *that* before subsequently becoming the specifier of the next highest C constituent in the structure, namely the main clause C containing *might*: consequently, RMC requires wh-movement to apply one clause at a time like the following sentence.



2.6 Agreement and A-movement

By looking at the sentence *He has arrested them* and also the following derivation, two important points should be clarified that why T can't agree with the complement *them* in an active structure like the following, and why in fact HAVE must agree with the subject *he* and hence is ultimately spelled out as the third person singular present tense form *has*.



One reason is Accusative Case Assignment in which an unvalued case feature on a goal is valued as accusative via agreement with a transitive probe. A second reason is that a head probes only as far as it needs to in order to ensure that all its unvalued features are valued.

When T-HAVE probes in the above structure, the closest goal which it locates is the subject *he*. Since *he* can value all the unvalued (person/number) agreement features on T, there is no need for T to probe any further and therefore in consequence of the Economy Condition no possibility of T probing further and agreeing with the object *them*.

2.7 Defective clauses with expletive subjects

On the basis of Radford (2004a, 2004b, 2009), the trace of economy condition can be seen in probe and agreement. For example in the sentence *There are thought likely to be awarded several prizes* and in the following structures the agreement and EPP features alike can only probe as far as the closest constituent which will satisfy all their requirements – and this condition in turn is arguably reducible to the Economy Condition of Chomsky (1989, p. 69) requiring that there should be ‘no superfluous steps in derivations’ and consequently once a probe has satisfied its requirements, it ceases to probe any further.

Since the EPP feature on BE in the following structure searches for a goal with person, it ceases to probe once it locates the closest person-specified goal, namely

there. But since the agreement features on BE require a ϕ -complete goal with both person and number, they probe as far as the QP *several prizes*.

| | | | | | |
|--------------------|----------------|----------|-----------------------|---------------------|------------------|
| [_T BE] | thought likely | [there] | [_T to] | be <i>t</i> awarded | [several prizes] |
| [Pres-Tns] | | [3 Pers] | [3 Pers] | | [3-Pers] |
| [<i>u</i> Pers] | | | [EPP] | | [Pl-Num] |
| [<i>u</i> Num] | | | | | [<i>u</i> Case] |
| [EPP] | | | | | |

3. Uniformity

Another important factor of MP is uniformity. What makes the uniformity and rapidity of acquisition even more remarkable is the fact that the child's linguistic experience is often degenerate (i.e. imperfect), since it is based on the linguistic performance of adult speakers, and this may be a poor reflection of their competence. Because language knowledge is common to all, the uniformity requirement stipulates that a model of acquisition must only involve properties of the situation known to affect all children.

The purpose of unification is to make easier the syntactic analysis of natural languages. Unification allows filtering out inappropriate feature options; while the unified feature combination characterizes the syntactic structure under analysis more precisely, leading to the true interpretation of the sentence.

The following principles can put forth the uniformity as an important MP factor:

3.1 Categorical Uniformity Principle

speaker a: I am feeling thirsty
 speaker b: Do you feel like a Coke?

The sentence produced by speaker *a* is declarative in force (by virtue of being a statement). If force is marked by a force feature carried by the head C of CP, this suggests that such declarative main clauses are CPs headed by a null complementiser carrying a declarative force feature.

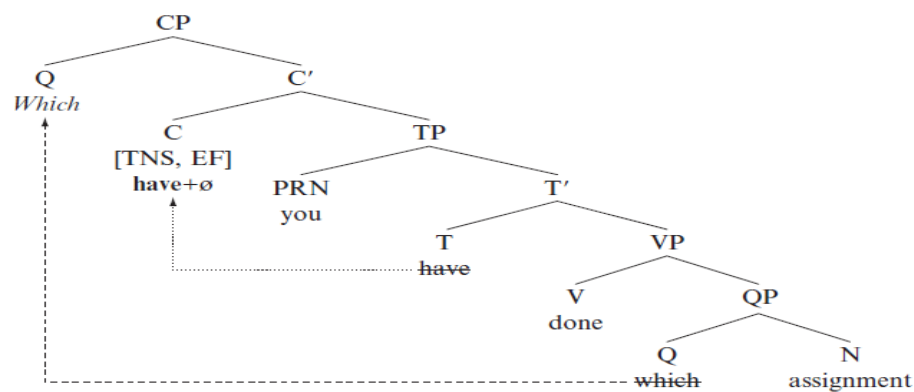
If we suppose that the set of UG principles wired into the Language Faculty include a Categorical Uniformity Principle to the effect that all expressions of the same type belong to the same category (and, more specifically, all clauses with the same force belong to the same category), it can be understood from the Categorical Uniformity Principle that all other declarative clauses (including declarative main clauses) must be CPs. This leads to the conclusion that a declarative main clause like that produced by speaker *a* is a CP headed by a null declarative complementiser. Indeed, the Categorical Uniformity Principle (Rizzi 1998; 2000) 'assume the fewest possible different elements' (Granfeldt and Schlyter 2004) happens to hold for the L2ers.

3.2 Chain Uniformity Condition

It requires that every copy in a movement chain to be uniform. On the basis of Chomsky (1995) a chain is uniform with regard to phrase structure status. So by

referring to the sentence *Which assignment have you done* and the following structure, this condition rules out the possibility of *which* moving on its own in the following structure because the moved wh-word *which* in spec-C has the status of a maximal projection by virtue of being the largest expression headed by the word *which*; by contrast, the null copy *which* left behind by wh-movement has the status of a minimal projection by virtue of being the head Q constituent of the QP *which assignment*.

The resulting wh-chain thus violates the Chain Uniformity Condition by having a maximal projection at its head and a minimal projection at its foot. In simpler terms, the Chain Uniformity Condition means that since the original occurrence of the quantifier *which* heads a QP, all other copies of *which* in the movement chain must also head a QP – and this will only be the case if QP rather than Q moves (Radford, 2004, 2009).



3.3 Uniform Theta Assignment Hypothesis/UTAH

- (a) *The students/?The camels/?!The flowers!/The ideas* were arrested
- (b) They arrested *the students/?the camels/?!the flowers!/the ideas*

Mark Baker(1988) adopted this idea into GB theory in the form of the Uniformity of Theta Assignment Hypothesis (or UTAH). If pragmatic restrictions on the choice of admissible arguments for a given predicate depend jointly on the semantic properties of the predicate and the thematic role of the argument, it will then follow that two expressions which fulfill the same thematic role in respect of a given predicate will be subject to the same pragmatic restrictions on argument choice.

Since passive subjects like those italicized in (a) originate as complements, they will have the same theta role (and so be subject to the same pragmatic restrictions on argument choice) as active complements like those italicized in (b).

It seems reasonable to suppose that thematic structure is mapped into syntactic structure in a uniform fashion, and that this is regulated by a UG principle such as Uniform Theta Assignment Hypothesis/UTAH. The UTAH states that constituents which fulfill the same thematic role with respect to a given predicate occupy the same initial position in the syntax.

So it follows from UTAH that if passive subjects have the same theta role as active objects, it is plausible to suppose that passive subjects originate in the same V-complement position as active objects.

4. Simplicity

On the basis of Chomsky (1951) the criterion of simplicity is that the shorter grammar is simpler, and that among equally short grammars, the simplest is that in which the average length of derivations is least. As a first approximation to the notion of simplicity, shortness of grammar will be considered as a measure of simplicity. In fact simplicity is increased by:

1. reduction of the number of symbols in a statement
2. reduction of the length of derivations

An obvious decision is to consider minimization of the optional part of the grammar to be the major factor in reducing complexity.

An important point to be considered is that economy and simplicity have mutual relationship. This means that economy leads to simplicity and simplicity causes economy.

5. Conclusion

Research in the principles-and-parameters framework has come to focus on conditions of minimality, leading to the notions of uniformity, simplicity and economy as three important central facts which a theory of minimalist program must seek to provide. These principles lead to rapidity and ease of acquisition and are related to each other to a great extent.

Also the course of acquisition is determined by a biologically endowed innate Faculty of Language/FL (or language acquisition program) within the brain, which provides children with a genetically transmitted algorithm (i.e. set of procedures) for developing a grammar, on the basis of their linguistic experience (i.e. on the basis of the speech input they receive). In other words, genetically all human beings are the same regarding innate Language Faculty. So, the more the three factors are provided, the easier and faster the acquisition will be.

Chomsky's Minimalist assumptions are based on 'economy principles' which aim to minimize derivations and reduce the burden of grammatical constraints and conditions imposed on the grammars of language; the goal is to make language learning easier and more economical. In fact economy can pave the way for the rapid and easier acquisition of language by unifying and simplifying the language children are exposed to. In fact if a language wants to be economical, it should have two important characteristics: unification and simplification. In other words when it is said that a language is economical it means that it is simplified and unified as well and vice versa.

Consequently, the shortest movement in economy, the simple derivation of structures and the same conditions, all in acquisition, consider the MP principles which leads to ease and rapidity of language acquisition.

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