

**Chomsky's Naturalistic Approach to Language:
The First Half Century and Beyond**

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I. Two different approaches to the study of language

- (1) "The only useful generalizations about language are inductive generalizations." Bloomfield (1933, p.20)
- (2) "Children want explanations, and there is a child in each of us; descriptivism makes a virtue of not pampering that child." Joos (1958, p.96)
- (3) "The over-all purpose of work in descriptive linguistics is to obtain a compact one-one representation of the stock of utterances in the corpus." Harris (1951, p.366)
- (4) "We are...interested in developing a theory that will shed some light on such facts as the following:
 1. A speaker of a language has observed a certain limited set of utterances in his language. On the basis of this finite linguistic experience he can produce an indefinite number of new utterances which are immediately acceptable to other members of his speech community. He can also distinguish a certain set of "grammatical" utterances, among utterances that he has never heard and might never produce. He thus projects his past linguistic experience to include certain new strings while excluding others.
 2. Furthermore, the speaker has developed a large store of knowledge about his language and a mass of feelings and understandings that we might call "intuitions about linguistic form." Chomsky (1955/1975, pp.61-62)
- (5) a What do we know when we are able to speak and understand a language?
b How is this knowledge acquired?
- (6) "A naturalistic approach will assume that like other complex systems, the human brain can be profitably viewed as an array of interacting subcomponents, which can be studied at various levels: atoms, cells, cell assemblies, neural networks, computational systems of the kind pioneered, at a primitive stage, by the Cartesians, and so on." Chomsky (1993, p.42)
- (7) "A naturalistic approach to linguistic and mental aspects of the world seeks to construct intelligible explanatory theories, taking as "real" what we are led to posit in this quest, and hoping for eventual unification with the "core" natural sciences..." Chomsky (1995a, p.1)

II. A Case Study: Interrogative Inversion

- (8) Will John solve the problem? [cf. John will solve the problem]
- (9)

Declarative	Interrogative
a. Susan must leave.	Must Susan leave?
b. Harry can swim.	Can Harry swim?
c. Mary has read the book.	Has Mary read the book?
d. Bill is sleeping.	Is Bill sleeping?
- (10) Interrogative inversion process - structure independent (1st attempt)
Beginning with a declarative, invert the first and second words to construct an interrogative.
- (11)

Declarative	Interrogative
a. The woman must leave.	*Woman the must leave?
b. A sailor can swim.	*Sailor a can swim?
c. No boy has read the book.	*Boy no has read the book?
d. My friend is sleeping.	*Friend my is sleeping?

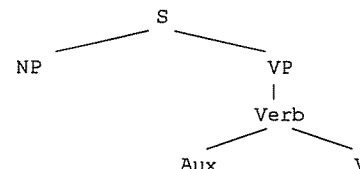
Compare these with the correct pairings:
- (12)

Declarative	Interrogative
a. The woman must leave.	Must the woman leave?
b. A sailor can swim.	Can a sailor swim?
c. No boy has read the book.	Has no boy read the book?
d. My friend is sleeping.	Is my friend sleeping?
- (13) Interrogative inversion process - structure independent (2nd attempt)
Beginning with a declarative, move the auxiliary verb to the front to construct an interrogative.
- (14)

Declarative	Interrogative
a. Bill could be sleeping.	Could Bill be sleeping?
b. Mary has been reading.	*Be Bill could sleeping?
	Has Mary been reading?
c. Susan should have left.	*Been Mary has reading?
	Should Susan have left?
	*Have Susan should left?
- (15) Interrogative inversion process - structure independent (3rd attempt)
Beginning with a declarative, move the first auxiliary verb to the front to construct an interrogative.
- (16)

Declarative	Interrogative
a. The man who is here can swim.	*Is the man who here can swim?
b. The woman who will sing has arrived.	*Will the woman who sing has arrived?
- (17) For these examples, fronting the **second** auxiliary verb gives the correct form:

- (18) Declarative
a. The man who is here can swim. Can the man who is here swim?
b. The woman who will sing has arrived. Has the woman who will sing arrived?
- (19) We are not dealing with a peculiarity of English. No known human language has a transformational process that would produce pairings like those in (16). Further, the incorrect forms in (16) (like the incorrect forms in (11) and (14), are not attested in any of the voluminous literature documenting the errors young children make in learning their language. In fact, experiments specifically designed to determine whether such incorrect forms are possible for children have invariably shown that they are not. The seemingly simple structure independent computational operations in (10), (13), and (15) are evidently not available to the human language faculty.
- (20) The right generalization is a priori much more complicated, relying on structured hierarchical organization:
- (21) Interrogative inversion process - structure dependent
Beginning with a declarative, move the first auxiliary verb following the subject to the front to construct an interrogative.
- (22) The man left.
(23) Mary sleeps.
- (24) These do have interrogative counterparts, but ones that initially seem to fall under entirely different mechanisms.
- (25) a. Mary sleeps. b. Does Mary sleep?
- (26) ???
- (27) a. Mary will sleep. b. Will Mary sleep?
- (28) Comparing (27)a and b, we see just the familiar inversion alternation.
- (29) But comparing (25)a and b, instead we see a change in the form of the main verb (from sleeps to sleep), and the addition of a form of the auxiliary verb do in pre-subject position.
- (30) Reconsidering (25), it is as if the inflectional ending (carrying present tense and 3rd person singular agreement information) that appears on the main verb sleeps in (25)a has moved to the front of the sentence, much as the auxiliary verb in the other examples (will in (27)) does. And in that fronted position, it is realized as an inflectional ending on a sort of 'dummy' verb do, that is, on a verb that makes no semantic contribution of its



- (33) $C \rightarrow \begin{cases} S \text{ in the context } NP_{\text{sing}} \\ \emptyset \text{ in other contexts} \\ \text{past in any context} \end{cases}$

- Structural analysis: $\left\{ \begin{array}{l} \text{NP} - \text{C} - \text{V} \dots \\ \text{NP} - \text{C+M} - \dots \\ \text{NP} - \text{C+have} - \dots \\ \text{NP} - \text{C+be} - \dots \end{array} \right\}$

Structural analysis: X - Af - v - Y (where Af is any C or is
en or ing; v is any M
or V, or have or be)

- (38) The fundamental insight of this system is that the tense-agreement inflectional morpheme ('C') is syntactically independent, even though always a bound morpheme superficially. Implementation of the insight requires a notion of abstract underlying structure.

- (39) John left John didn't leave
 John should leave John shouldn't leave
 John has left John hasn't left
 John is leaving John isn't leaving

- (40) John left John **did** leave
 John should leave John **should** leave
 John has left John **has** left
 John is leaving John **is** leaving

- | | | |
|------|-------------------|-----------------|
| (41) | John left | Mary did too |
| | John should leave | Mary should too |
| | John has left | Mary has too |
| | John is leaving | Mary is too |

IV. Minimalism

- (42) Languages are based on simple principles that interact to form intricate structures. {Here, minimalism is simply the culmination of a decades old research direction.}
- (43) The language faculty is 'nonredundant'. For example, an ill-formed sentence is ruled out by just one principle or constraint.
- (44) The language faculty has 'symmetry': parallel phenomena fall under the same principles.
- (45) Principles of 'economy' play a central role in determining computations and the structural descriptions they generate.
- (46) Language has two interface levels: LF, which interfaces with the conceptual-intentional performance system; and PF, which interfaces with the articulatory-perceptual performance system. There are no other levels.
- (47) Conditions on the levels represent necessary properties of the interfaces.
- (48) A linguistic expression is a formal object that satisfies the interface conditions in the optimal way.
- (49) "At the methodological level, the [minimalist] program has a certain therapeutic value. It encourages us to distinguish between genuine explanations and 'engineering solutions'..." Chomsky (1998, p.4)
- (50) "The minimalist program [hopes to show] that elimination of descriptive technology yields empirical results that are as good, or perhaps better, than before." Chomsky (1998, p.4)
- (51) "How 'perfect' is language?" Chomsky (1995b, p.9)

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