

**Linguistics as a Cognitive Science:
Noam Chomsky's Naturalistic Approach to Language**

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I. Two different approaches to the study of language

A.

- (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)

B.

- (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]

- | 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.

- | 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:

- | 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.

- | DECLARATIVE | INTERROGATIVE |
|----------------------------|---|
| a. Bill could be sleeping. | Could Bill be sleeping?
*Be Bill could sleeping? |
| b. Mary has been reading. | Has Mary been reading?
*Been Mary has reading? |
| c. Susan should have left. | 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.

- | DECLARATIVE | INTERROGATIVE |
|------------------------------------|----------------------------------|
| a. The man who is here can swim. | *Is the man who here can swim? |
| b. The boy who will play has left. | *Will the boy who play has left? |

(17) For these examples, fronting the **second** auxiliary verb gives the correct form:

- (50) "An alternative we did not consider was to eliminate the zero morpheme and to state simply that no affix occurs if the subject is not third person singular." Chomsky (1957, p.64)
- (51) They work Do they work
 (52) They don't work
 (53) They **do** work
 (54) We work They do too
- (55) The reason for rejecting that alternative out of hand was that it would have substantially complicated the system with no concomitant benefit.

III. Minimalism

- (56) Over the decades, simpler and simpler syntactic theories have been put forward, with more general rules and principles.
- (57) Surprisingly, these simplifying developments in the theory have generally led to greater breadth and depth of understanding of both how human languages work and how they are acquired by children. This success has led Chomsky to put forward a 'minimalist program' as a working hypothesis:
- (58) Languages are based on extremely simple principles that interact to form intricate structures. (Here, Minimalism is the culmination of a decades old research direction.)
- (59) The language faculty is 'nonredundant'. For example, an ill-formed sentence is ruled out by just one principle or constraint.
- (60) Principles of 'economy' play a central role in determining computations and the structural descriptions they generate. No superfluous steps in derivations, no superfluous symbols in representations.
- (61) Language has two interface levels: Logical Form, which interfaces with the conceptual-intentional performance system; and Phonetic Form, which interfaces with the articulatory-perceptual performance system. There are no other levels.
- (62) Conditions on the levels represent necessary properties of the interfaces.
- (63) A linguistic expression is a formal object that satisfies the interface conditions in the optimal way.
- (64) "At the methodological level, the [minimalist] program has a certain therapeutic value. It encourages us to distinguish between genuine explanations and 'engineering solutions'..."
 Chomsky (2000, p.93)
- (65) "The minimalist program [hopes to show] that elimination of descriptive technology yields empirical results that are as good, or perhaps better, than before." Chomsky (2000, p.93)

- (66) "How 'perfect' is language [as a system relating sound and meaning]?" Chomsky (1995b, p.9)

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