Levels of adequacy: Chomsky vs. Behaviorism

Elsa Skënderi Rakipllari
Faculty of History and Philology, Department of Linguistics, University of Tirana, Tirana, Albania
E-mail: skenderi.elsa@gmail.com

Received: 5 March 2015  Reviewing editor: Andrey G. Kirillov
Accepted: 15 March 2015  Published online: 1 April 2015

Abstract

This paper compares and contrasts the standpoints of Chomsky and behaviorism on the grammar adequacy levels. Firstly we bring into attention the philosophical views of Chomsky and behaviorism respectively on the language faculty, providing a theoretical point of departure to further elaborate the concept of grammar adequacy. The three levels of adequacy a grammar can attain are observational adequacy, descriptive adequacy, and explanatory adequacy. The paper analyzes the tension among descriptive and explanatory adequacy. Next, it argues why the behaviorist grammars are considered to be at their best descriptively adequate. To conclude we offer an insight into what goes wrong with explanatory adequacy.

Keywords

grammar adequacy; observational adequacy; descriptive adequacy; explanatory adequacy; Chomsky; behaviorism

For citation


INTRODUCTION

The history of linguistics holds Noam Chomsky as one of the wildest adversaries of behaviorism and the scholar who revolutionized the linguistic thought of the 20th century. Except
the disputes regarding the behaviorist view of language and antimentalism, Chomsky also argued that behaviorist/structuralist grammar was not able to reach the third level of grammar adequacy, that of explanatory adequacy. The main reason was the disregarding of mental processes in language studies. According to Chomsky, the third grammar adequacy level was within the reach of universal grammar. But was Chomsky right? Do explanatory adequate grammars exist? How about explanatory adequacy, is it attainable?

When faced with the need to study the Amerindian languages, behaviorists relayed on descriptive methods for collecting and interpreting the data. They insisted that descriptivism would give linguistics a scientific status. According to Bloomfield and his followers, observable evidence was the only basis to build a scientific theory. The prerequisites for this aim were reliance in inter-subjectively accessible observation, disregarding thought, intuition or concepts. “Bloomfield’s ideas defined the temper of the linguistic time, that it was primarily a descriptive and taxonomic science, like zoology, geology, and astronomy; that mental speculations were tantamount to mysticism, an abandonment of science” (Harris 1995, 27)

The strong antimentalism reduced the language and concepts to a verbal behavior. “No special kind of mind stuff is assumed. A physical world generates both physical action and the physical conditions within the body to which a person responds when a verbal community arranges the necessary contingencies.” (Skinner 1974, 220, cited in Delprato and Midgley 1992, 1511)

Basically the behaviorists developed certain ways to gather linguistic data in the context where the language was produced. Their goal was to describe these morphological and phonological structures correctly, without being distracted by the mental aspects. The work for building up a grammar was first preceded by presenting the observed data correctly and then describing it.

Chomsky contrarily to behaviorists claimed that the knowledge of language is not something humans acquire from the environment and through analogical mechanisms. The poverty of stimulus became in the sixties the slogan of the new linguistics inquiry that Chomsky introduced. “The poverty of stimulus considerations support the view that the initial cognitive state, far from being the tabula rasa of empiricist models, is already a richly structured system. The theory of the initial cognitive state is called Universal Grammar.” (Belletti and Rizzi 2002, 8) Notably the knowledge of language was seen as an internal mental faculty of the mind that was biologically endowed to humans. “But if all adults were suddenly to die the children were somehow to survive, then whatever it is they are speaking would be a human language, though one that does not now exist.” (Chomsky 2002, 49)

When referring to the language competence, Chomsky assumes the presence of an ideal speaker. In addition, he claims that in the rational inquiry the domain has to be idealized “in such a way (we hope) as to permit us to discover crucial features of the world.” (Chomsky 2002, 49) This idealization reduces the importance of data and observations simply to “an instrumental character”.

One of the shortcomings of American structuralism and behaviorism was the lack of analysis in the domain of syntax. Although the Bloomfieldian scholars were diligent in the field research and the phonetic-morphological detailed analyses, syntax still was one of their wasted lands. “When they went out to bag a language, their descriptive grammars always dutifully
included a chapter or two on syntax. [...] What was missing was method, and since method was the defining notion of science for Bloomfield, syntactic work usually came with an air of embarrassment.” (Harris 1995, 30) The revolutionizing linguist Chomsky set his dominion in this waste land of linguistics, in syntax.

**Grammar (theories) and adequacy**

Except for many other central notions and the object of their linguistic inquiry, Chomsky criticized behaviorists also for the lack of explanatory adequacy in their grammars. He claimed that although these grammars were explaining even the most intricate details and irregularities, they were actually not explaining the regularities that lay further beyond the grammar of a specific language; the regularities emanating from the internalized linguistic knowledge.

In his book “Aspects of the Theory of Syntax” (1965) Chomsky argues that the difference within the anti-mentalists and mentalists arises from the fact that anti-mentalists are not interested in building a theory of language. “The behaviorist position in not an arguable matter. It is simply an expression of lack of interest in theory and explanation. [...] this lack of interest in linguistic theory expresses itself in the proposal to limit the term “theory to “summary of data” (193-194)

But what is the commonness of grammars and theory of language? Gerald A. Sanders (1974, 16) argues that the linguists have to both construct grammars and theories of grammars, which can be differently referred to with the term theory of language. As to Chomsky (1965) he almost puts an equal sign them, stating that the theory of language can be regarded as a grammar, but one that is descriptively adequate for each language.

First of all we have to give a definition of the grammar according to the Chomskyan paradigm. “A grammar is a model of the grammatical competence of the native speaker of a language. [...] It comprises a finite system of rules which generate the infinite set of well-formed sentence-structures in the language” Radford (1988, 27)

Chomsky introduced the concept of adequacy for constructing and evaluating a grammar or theory of grammar (language). There are three levels of adequacy that a grammar/grammar theory can reach: Observational adequacy, descriptive adequacy, explanatory adequacy.

**Observational Adequacy** is the lowest adequacy level. This level can be reached when “the grammar of a particular language specifies which sentences are and are not well formed in that language.” (Green 2006, 49) The observationally adequate grammar is build upon the data observed from a certain corpus and does not take into account the sentences and linguistic constructions outside the assigned corpus.

**Descriptive Adequacy** is the second adequacy level and Chomsky defines it as follows, “The grammar of a particular language satisfies the condition of descriptive adequacy insofar as it gives full and accurate account of the properties of the language, of what the speaker of the language knows.” (Chomsky 2000, 7) A descriptively adequate grammar regards the tacit knowledge of language of the native speakers (for example when making judgments on the acceptability of a sentence or structure), but it does not motivate or explain where does this knowledge that the speaker possesses, come from.
Chomsky claims that behaviorist language descriptions are at best descriptively adequate and this is not a matter of “truth or falsity”. The behaviorism on purpose does not give explanations on the knowledge of language that the speakers hold, since dealing with this would make them enter the mentalist domain. Behaviorists are not concerned to shed light to the mental activities or introspection, but to find out the patterns of the observable behavior. Their canon was that “In the division of scientific labor the linguist deals only with the speech signal...; he is not competent to deal with problems of physiology or psychology.” (Bloomfield 1933, 32, cited in Derwing 1980)

Chomsky relates the behaviorists’ antimentalism with the fact that they were not interested in theory and that there was a tendency to reduce the theories to “summary of data”. “In fact, the issue of mentalism versus antimentalism in linguistics apparently has to do only with goals and interests. [...] It is simply an expression of lack of interest in theory and explanation.” (Chomsky 1965, 194)

Another flaw of the behaviorist inquiry was that the researcher would rely only on what the native speaker was reporting on his language, without taking in consideration the possibility that the speaker reports mistakenly. Chomsky suggests that, “It is quite apparent that a speaker’s reports and viewpoints about his behavior and his competence may be in error. Thus a generative grammar attempts to specify what the speaker actually knows, not what he may report about his knowledge.” (Chomsky 1965, 8)

Except the mentioned limitations the grammars of behaviorism did not comply with the third adequacy level, that of **Explanatory Adequacy**. This third criterion is according to Chomsky the *sine qua non* of the “genuine theory of human language”, which “has to satisfy two conditions, ‘descriptive adequacy’ and ‘explanatory adequacy’” (Chomsky 2000, 7).

The definition of explanatory adequacy is broad but mainly stands for discovering linguistics universals. The explanatory adequate grammar goes beyond just describing the tacit knowledge of language, but even explains where the knowledge comes from, focusing on the mental aspects.

“A linguistic theory that aims for explanatory adequacy is concerned with the internal structure of the device [i.e. grammar]: that is, it aims to provide a principled basis, independent of any particular language, for the selection of the descriptively adequate grammar of each language” Chomsky (1964, 63).

Chomsky claims that his Universal Grammar theory is explanatory adequate because it sets universal principles that generate structures and sentences for all the languages. The explanatory adequacy goes further than the descriptive adequacy, as it explains how speakers attain the knowledge of language.

Since the descriptive adequacy is a precondition to the explanatory adequacy, there is a paradoxical tension within the two levels of adequacy. On one hand the descriptive adequacy requires intricate and enriched analysis of every single language; on the other hand the explanatory adequacy foresees a minimal number of principles to explain why the descriptively adequate grammars are build so, and what do they have in common.
Tensions among Descriptive Adequacy and Explanatory Adequacy

The descriptively adequate grammars require a broad empiric data, thus there were more analytic tools needed to analyze these data. On the other hand explanatory adequacy needs a restricted descriptive apparatus, and the grammar has to be maximally constrained and descriptively impoverished. As Radford (1988) defines in his book “Transformational grammar, A First Course” the explanatory adequacy is achieved “in case that it provides a descriptive adequate grammar for every natural language, and does so in terms of a maximally constrained set of principles which represent psychologically plausible natural principles of mental computation” (30)

Chomsky seems to be aware of this tension within the two consecutive levels of adequacy, which he calls a paradox.

There is a serious tension between these two research tasks. The search for descriptive adequacy seems to lead to ever greater complexity and variety of rule systems, while the search for explanatory adequacy requires that language structure must be invariant, except at the margins. (Chomsky 2000, 6)

What was proposed as the solution to this tension was the new idea that the Universal Grammar a system was based on Principles and Parameters. The fixed Principles are said to be the invariants, and the parameters are the options that a child has to choose from experience. So he has to set the parameters. The new approach would still make the level of explanatory adequacy attainable, and would make it possible to affirm the rules of a particular language in a concise form, despite descriptive complexity.

Melanie Green (2006) suggests that another solution to the ‘tension problem’ was “the move away from sets of constructions and construction-specific transformational rules to the single generalized transformational rule Move-alpa represented a move toward explanatory adequacy.”

But the real question regarding the adequacy level in my view has to do again with the evaluation process. In practice it seems too difficult to evaluate if a grammar is descriptively adequate or not and the most important thing is the descriptively adequacy is fully achievable at all? Are the descriptions accurate? We are going to consider these questions in the following section.

What goes wrong with Explanatory Adequacy?

Emmon Bach in his article “Explanatory inadequacy” (1974) considers “To think about thinking about language”, a “meta-worry”. According to him the linguistic inquiry has a two-fold purpose. The first one is to explain the facts of linguistic languages and the second one to explain these explanations, thus aiming to build a theory of language. Bach implies that this ‘meta-worry’ is what requires an explanatory adequacy, although it is meaningless to him. Some arguments that Bach lists against the existence of an explanatory adequacy are as follows:

1. Since a large part of linguistic data is not inter-subjectively testable, it is arbitrary to talk about explanatory theories.
2. The overrate of linguistic competence over performance is not relevant in linguistic inquiry. Since the explanations have to be tested based on the performance and the level of explanatory adequacy can not be reached only based on the competence theory. “We need to work on performance and competence simultaneously. [...] We can’t be confident that we’ve gotten a good explanation of a certain range of linguistic facts unless we’ve considered alternatives involving theories of language use, language acquisition, cognitive theories in general and so on.” (Bach 1974, 168)

3. Bach finds the terms descriptive adequacy and explanatory adequacy irrelevant, because it is not sufficient to answer to the question why the languages are constructed in the way they are, just by describing them. Similarly grammars can not be explained just by innateness. “To “explain” these facts by saying that the specification is innate is to my mind to give a non-explanation. We are saying in effect, human languages are the way they are because they are the way they are.” (ibid. 169) (the listing is mine)

The arguments of Bach shed light to the theoretical problems of adequacy. Said that, we will see further what ‘goes wrong’ with adequacy levels on more practical grounds.

A descriptively adequate grammar would be that which considers all the number of grammatical sentences of a corpus. When aiming to construct a descriptively adequate grammar of a certain language, it is difficult to think that the available corpus of this language is able to include all the possible sentences of the language.

The sources used in descriptive linguistics to collect data are, the intuition of the linguist (which typically is a native speaker of the language and describes the language based on his knowledge. The by-name of this linguist is “the armchair linguist”), elicit of the intuition of native speakers, speech recording, questionnaires, and electronic corpora (linguists known with the by-name “button collectors”). All these methods of research are inside the domain of linguistics. The greater the corpus that will be considered, the greater will be the predictability of the grammar. But of course the predictability differs from the explanation.

To get back to the idea of Emmon Bach (1974) the best adequacy level that can be reached is that of “(meta-) descriptive adequacy”. This is a pure consequence of taking into account only the linguistic domain, as an autonomous one. To get close to satisfactory explanations linguists have to consult even other domains of human knowledge.

In our opinion the explanatory adequacy of a grammar is not possible. In the Chomskyan theory, explanation is limited to the innateness of language knowledge and language acquisition, but “We cannot know if the grammar reflects the way language knowledge is organized in our minds” and at the same time there is no proof that “the basis for linguistic intuitions is syntactic in origin and hence must be characterized by rules which try to derive one syntactic structure from others.” (Derwing 1980)

Not to mention that there are problems even with the level of descriptively adequacy. Explaining at the descriptive level is one thing, yet determining what goes on in the speaker’s mind is another different thing. In his prominent article “Against Autonomous Linguistics” Derwing (1980) reasonably suggests, there are many ways of ‘describing’ based on the aim of the grammar (pedagogical, historical etc.). Furthermore there seems not to be any “a priory correct answer” to the question how to describe the grammar properly.
To conclude there are two facts to be kept in mind, the first one is that the models are only practical tools to test a theory, and they are simpler than the reality. Secondly, a theory which considers linguistics as an autonomous domain, especially independent of the user and the context, is far away from attaining explanatory adequacy on its own. Although Chomsky is said to have revolutionized the linguistic thought, yet there is a common approach in his theory and the behaviorist stand to linguistics, mainly related to the principle of an Autonomous Linguistics.

References

Declaration of conflicting interests
The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author received no financial support for the research, authorship and/or publication of this article.

Author information
Elsa Skënderi Rakipllari is a PhD candidate at the University of Tirana, Albania.

Copyrights
Copyright for this article is retained by the author, with publication rights granted to the journal.