



Farabi's Logico-Linguistic Ideas in Comparison with Theories and Principles in Contemporary Linguistics

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Abstract. This research is an attempt to make a comparison and contrast between Farabi's logico-linguistic ideas, as an Iranian scientist, philosopher, and logician, with the contemporary linguistic theories and principles. To make this comparison and contrast possible, we would review the most relevant and outstanding contemporary linguistic theories and then compare them with those of Farabi. To our astonishment, we made it clear that Farabi introduced the science of language to the learned people of his time around ten centuries ago long before the introduction of linguistics as a separate branch of human sciences. He enumerated the sciences of his time as (1) the science of language, (2) the science of logic, (3) educational sciences, (4) natural sciences, (5) theology, (6) civil sciences, (7) the science of jurisprudence, and (8) theosophy. The science of language includes further sciences of (1) the science of singular terms, (2) the science of compound terms, (3) the science of the rules of singular terms, (4) the science of the rules of the compound terms, (5) the science of the rules of correct writing, (6) the science of the rules of correct reading, and (7) the science of poetry. It is noteworthy that Farabi's ideas regarding the phenomenon of language bear overwhelming similarities with those of contemporary linguistics. For example, according to Farabi, the science of the rules of singular words, as the third of his seven-category science of language, studies the letters, sounds, and words of a specific language. In the science of the rules of compound terms, as the fourth category, sentences and their components are studied. The ideas and theories he developed in this regard have many things in common with Chomsky's Constituent Grammar. Furthermore, Farabi makes a distinction between the science of syntax and the science of logic and creates a relation between them which reminds us of Chomsky's Universal Grammar including principles and parameters, the Language Acquisition Device, and surface and deep structures. In Farabi's opinion, the science of logic makes three different interpretations of the term logic. According to the first interpretation, logic refers to the external speech which is represented in the form of sounds of a language. That is, the external speech receives phonetic representation. This interpretation is similar to Chomsky's surface structure. In the second interpretation, logic means the soul-centered inner speech, which resembles the deep structure of Chomsky. In the third interpretation, logic is equal to the thinking faculty of the soul which is unique to human beings like Universal Grammar, the Innateness Hypothesis, and the Language Acquisition Device. This paper is thus a description of the above-mentioned ideas, theories, and principles and the elucidation of their similarities and differences with those developed by Farabi.

Keywords: Farabi's Logico-linguistic Ideas, Contemporary Linguistics, Farabi, Saussure, Chomsky

1. INTRODUCTION

Linguistics was separated from philosophy and psychology in a linguistics conference at Hague in 1928 in which many outstanding linguists participated. Linguistics was then recognized as an autonomous discipline. Saussure's writings (1916) were influential in this regard. His definition of language paved the way for the autonomy of linguistics. He believed that languages are different and each language is a unique system of its own and also as a system of interrelated elements. When at least two linguistic elements come together, they make a linguistic structure. This approach to the arrangement of interrelated linguistic elements was later referred to as structuralism as a school in linguistics. To characterize the nature of language, he made four binary distinctions. The first binary distinction is between *langue* and *parole*. The *langue* is the whole body of language while the *parole* is the actual use of the *parole*. The second binary distinction is between the *substance* and *form* of language. Substance

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is the matter out of which all languages are *formed*. In other words, it is the building blocks of all languages while form is the specific shape a particular language takes such as English, Persian, French, etc. Another binary distinction is *syntagmatics* and *paradigmatics*. Syntagmatics is the horizontal relationships between the elements in the sentence while paradigmatics is the vertical relationship between the elements in the sentence. It is out of syntagmatics which Phrase-Structure Grammar emerges. The last binary distinction is the *synchronics* and *diachronics*. Synchronics is the study of the language at a particular point of time while diachronics is the study of the language over time.

According to Saussure, the linguistic elements come together in a syntagmatic relationship to make structures in the language. For example, when the words *the*, *linguistic*, and *conference* come together, they make the linguistic structure *the linguistic conference*, which is called a noun phrase. Structuralism is not confined to the level of phrases. It is extended to the level of sentences as well. For instance, the sentence *linguistics is the scientific study of language* is a larger structure at the sentential level composed of noun and verb phrases. The same goes on in the structure of words at the phonetic level. When certain sounds come together, they make words. The sounds /b/, /l/, and /n/ make the phonetic structure /bin/. Similarly, Farabi, in two of his treatises, namely, *The Enumeration of Scieces (Ehsa-Al-Oloom)* and *The Categories (Alhorooft)* speaks of the linguistic sounds and their nature. Also, he treats of sentences as units comprising noun phrases and verb phrases, which have many things in common with Saussurean structuralism and modern approaches to the study of language such as Phrase-Structure Grammar. This paper is then a comparison of Farabi's ideas regarding the phenomenon of language with the theories in modern linguistics. It is obvious that this paper cannot analyze all the theories in modern linguistics for the pressure of the space. Instead, we would mention and briefly describe ones most comparable with those of Farabi, an Iranian philosopher, logician, physicist, and scientist who was born in A.D. 879. They include Phrase-Structure Grammar or Constituent Grammar, Transformational Generative Grammar, the theories of the Surface and Deep Structure, Universal Grammar, the Faculty of Language, the Modularity Theory, and Language Acquisition Device.

2. THE PHRASE-STRUCTURE GRAMMAR

Although Saussure founded structuralism, his analysis of language remained at the word level, and his major concern was the historical study of language. Later linguists such as Fries, Bloomfield, and Chomsky continued his structuralist tradition. The Phrase-Structure Grammar was the first approach to applying structuralism to linguistic analysis. According to the Phrase-Structure Grammar, which was later referred to as Constituent Grammar by Chomsky (1957), a sentence is broken down into its various parts or constituents, that is, noun phrases, verb phrases, adverb phrases, adjective phrases, etc. For example, a sentence is first broken down into a noun phrase and a verb phrase. The noun phrase itself is divided into a determiner and a noun. The verb phrase is divided into a verb and a noun phrase. Similarly, the noun phrase is divided into a determiner and a noun. The structure of a sentence can be illustrated in a diagram called a tree diagram.

Phrase-Structure Grammar can analyze many sentences, but it cannot analyze imperative and interrogative sentences. In imperative sentences in English, for example, the noun phrase which occurs initially in the sentence as the subject is absent in the surface structure of the sentence. And, in interrogative sentences in English, an auxiliary verb is used at the beginning of the sentence. Such sentences cannot be analyzed using Phrase-Structure Grammar, because in imperative sentences the noun phrase as the subject of the sentence is missing, and in

interrogative sentences, an auxiliary appears before the noun phrase as the subject of the sentence. Chomsky put forward the theories of the surface and deep structure and transformations to analyze imperative sentences to analyze the interrogative sentences using the English data. He remarks in this regard that in imperative sentences the subject, though absent in the surface structure, is present in the deep structure. To explain the interrogative sentences (such as *can I help you?*), he asserts that a transformation called the movement transformation, inserts the auxiliary verb to the beginning of the sentence. By so doing, such sentences, which could not be analyzed using Phrase-Structure Grammar, are easily analyzed. Farabi makes similar interpretations in the science of syntax from which the notion of Phrase-Structure Grammar or Constituent Grammar can be inferred. In the science of language, Farabi, talks about the single and compound terms and the rules related to such terms. The single terms include private and general nouns, verbs, articles, prepositions, inflection, etc. The private nouns include such names as Ali, Mary, John, etc. The general nouns, on the other hand, include such names as whiteness, brevity, animals, man, etc. To make compound terms, these single terms, as Farabi (2010, p. 43) remarks, are combined together to make sentences. Therefore, a sentence can be synthesized by a combination of the afore-mentioned single terms. In contrast, a compound term can be analyzed and broken down into its constituent single terms including nouns, verbs, articles, and prepositions.

We previously witnessed a similar analysis in the description of Phrase-Structure Grammar or Constituent Grammar in which a sentence is broken down into its constituents. The point worthy of note here is that Phrase-Structure Grammar or Constituent Grammar are hierarchical in the sense that a sentence is broken down into the immediate constituents of the noun phrase and verb phrase. At the next level of analysis, the noun phrase, functioning as the subject of the sentence, is broken down into the ultimate constituents of a determiner and a noun, and the verb phrase is broken down into the final constituents of a verb and the immediate constituent of a noun phrase. The noun phrase in the verb phrase, functioning as the object of the sentence, is broken down into the immediate constituents of a determiner and a noun. It is implied that Farabi's synthetic constituent grammar seems to be linear. Simply speaking, the single terms as constituents are combined together to make compound terms or sentences (Farabi, 2010, p. 47).

3. THE DEEP STRUCTURE AND SURFACE STRUCTURE

In Transformational Generative Grammar (Chomsky, 1965), the deep structure refers to the underlying meaning of the sentences; the surface structure is abstract and considered to be in the mind. It is the physical manifestation of the deep structure in the form of the sounds or letters of the language; that is, in what a person speaks, hears, reads, and writes. Regarding the surface and deep structure, Chomsky further remarks that the deep structure of all languages is the same. What makes languages different is their surface structure. English and Persian, for example, are the same in terms of their deep structure. What makes English different from Persian, according to Chomsky, is their surface structure. For example, English follows a Subject-Verb-Object word order while Persian follows a Subject-Object-Verb word order. The example of the word order in English and Persian is something related to the surface structure of these two languages while their deep structure is the same.

Ideas similar to the theory of the surface and deep structure are raised by Farabi, not in the science of syntax, but in the science of logic. Farabi, as mentioned already, makes three different interpretations of the term logic. In the first and the second interpretation of the term logic, the concepts of the surface and deep structure can be inferred and derived, respectively. Farabi's (2010, p. 61) first interpretation of the term logic refers to the external speech in the module of logic. The external speech for Farabi is the phonetic representation of the thoughts and ideas in the soul. It is the same as the expression of the inner self. This idea from Farabi is

similar to Chomsky's theory of the surface structure. The notion of the deep structure is embodied in Farabi's second interpretation of the term logic when he refers to logic as "the inner speech in the soul" which refers to the categories and thoughts in the mind for which the single and compound terms are created (Farabi, 2010, p. 61). These categories in the soul, as Farabi mentions while he is describing the term logic in its third interpretation, are said to be the common features and characteristics of different nations and languages. Therefore, these logical internal ideas in the soul are similar to Chomsky's theory of the deep structure, which is the abstract and underlying meaning of the compound terms or sentences in different languages. In sum, Farabi's external speech can be an equivalent for Chomsky's surface structure while his inner speech seems to equal Chomsky's deep structure.

4. THE THEORY OF THE INNATENESS OF LANGUAGE

From the similarities between languages and the easy and quick acquisition of language by children, who are cognitively immature, Chomsky derives the innateness of language. Chomsky (1966) enumerates further reasons for the innateness of language as follows:

- 1- Language is the most abstract and complex phenomenon human beings ever learn (Cook & Newson, 1997, P. 82). The interesting point is that such an abstract and complex phenomenon is mastered "by age five" (Cook & Newson, 1997, P. 55) by the children when they are cognitively immature. Such children cannot solve easy problems in physics and mathematics. Therefore, children must be endowed with an inborn capacity which helps them acquire the abstract and complex phenomenon of language.
- 2- It takes at most five years for children to master the language. This is even the case for children having a low intelligence. In contrast, mastering sciences such as physics, mathematics, or chemistry takes years of the life of scientists.
- 3- The linguistic data children are exposed to are full of irregularities, incorrect forms, and even ungrammatical sentences. Mostly, they are exposed to phrases and words rather than sentences. In other words, the linguistic stimuli they are exposed to are mostly poor, or there is poverty of stimulus in the linguistic data children receive from people around them (Brown, 2014, p. 55). Now, children elicit a full grammar out of such incomplete and even erroneous data. This is a proof of the fact that children are assisted more from within than without by an inborn capacity (that is, the LAD or UG).
- 4- Children produce sentences they have not been exposed to. In other words, children produce sentences they have never heard or seen on the printed page. This means, according to Chomsky (1966, pp. 9-10), that children's language is creative or productive. This creative or productive language, which Chomsky calls Transformational Generative Grammar, contains a finite set of rules which can produce an infinite number of sentences. The inborn capacity of language is unique to the human species. Animals have not been endowed with such a linguistic faculty. In fact, one of the distinctive characteristics of the human beings in contrast with the animals is humans' power of speech.

Farabi makes similar arguments regarding the phenomenon of language in his third interpretation of the term logic. In the third interpretation, he calls logic "the distinct human faculty in the soul" (2010, p. 62). This logical faculty is unique to human beings, which are actively involved in the process of thinking and making knowledge. This innate logical ability convicts that the statements people hear or produce are true or false. Avicenna, as successor to Farabi, refers to this innate logical faculty as the theoretical reason, which "makes sciences, knowledge, and correct thinking possible". In contrast, Avicenna's practical reason, which exists

in both humans and animals, are involved in controlling the movements of the body (Nasr, 1964). Accordingly, for Farabi and his succeeding philosopher, Avicenna, this innate faculty makes language acquisition possible. This faculty is stationed in the module of logic in the soul while Chomsky's language faculty exists in the module of language in the mind.

5. UNIVERSAL GRAMMAR AND THE LANGUAGE ACQUISITION DEVICE

The theory of Universal Grammar (also UG) was proposed by Chomsky. It is "innate linguistic knowledge" (Isac & Reiss, 2008) which is common in all human beings and present at birth. UG includes a set of principles and parameters which "account for the grammatical competence of every adult no matter what language he or she speaks" (Richards, Platt, & Platt, 1992, p. 392). The principles are common in all languages while parameters vary from one language to another (Cook, 1988; White, 1989). An example of a parameter is the word order in English and Persian. In a normal English sentence, as mentioned earlier, the word order is the subject-verb-object sequence while the Persian word order is the subject-object-verb sequence. On the other hand, both English and Persian place the subject of the sentence in the initial position of the sentence, which is an example of a principle.

Universal Grammar is related to the Language Acquisition Device (also LAD). The Language Acquisition Device is a capacity or apparatus which children are born with to acquire their first language. It is, as Chomsky (1964) calls it metaphorically, a black box. The input goes into and the output comes out of this black box. To understand the underlying processes inside the box, we should know about such linguistic input and output (Cook & Newson, 1997, p. 79). Therefore, the LAD is "a procedure that operates on experience acquired in an ideal community and constructs from it, in a determinate way, a state of the language faculty" (Chomsky, 1990, p. 69). To illustrate the nature of the LAD and its interplay with the experience (i.e., input), Chomsky (1964) proposes a diagram in which the LAD or UG, as the primary linguistic data, is exposed to the input from the environment. After a short period of time (5 years), the LAD is activated and becomes ready to produce output, a generative grammar, which is the same as the linguistic competence of the speakers.

Contrary to Chomsky, Farabi believes that there is no innate linguistic knowledge in the soul. Instead, he believes, as he mentions in the third interpretation of the term logic, that the logical faculty in the soul is innate and makes the acquisition of sciences, knowledge, correct thinking, and correct convictions in general and the acquisition of the language in particular possible. Therefore, Chomsky's Universal Grammar and the Language Acquisition Device exist in the module of language not in the module of logic. The Innate Logical Faculty of Farabi is, in contrast, a general unitary ability which makes every piece of learning possible. Therefore, according to Farabi, there is no such an ability called Universal Grammar and the Language Acquisition Device developed by Chomsky. Farabi's ideas in this regard are similar to the ones mentioned by cognitive theorists who see the mind as a single elaborated network (Anderson, 1983), as a single unitary system (McLelland & Rumelhart, 1986). Piaget also thinks in the direction of Farabi (1980) when he says that there is a continuity in language development arising from earlier acquired cognitive processes. Piaget conceives of a general intellectual ability in human beings which is actively involved in the processes of learning in general and language learning in particular.

6. THE MODULARITY THEORY

The Modularity Theory assumes that the mind is composed of separate modules or compartments. Each module is responsible for some aspect of mental life. Logic and language are two of the modules of the mind in the sense that logic and language are separate from one another. In other words, they are distinct from one another and are not thus inter-related. Universal Grammar is a theory of the language module distinct from the other modules of the mind such as logic and intelligence. The Modularity Theory is in contrast with the cognitive theories that assume "the mind is a single unitary system" (Cook & Newson, 1997, p. 31). This unitary mental system makes the learning of every piece of learning such as learning language, sciences, sports, etc. possible.

Furthermore, followers of the theory of the modules of the mind such as Chomsky speak of the mind in terms of organs in an analogy with the organs of the body such as the lungs, the heart, the liver, etc. Similarly, they think of the mind as a composite of organs such as the language organ, the logic organ, the mathematics organ, etc. Therefore, the theory of language (e.g., UG) is simply that part of the mental psychology which deals with one particular organ, 'human language' (Chomsky, 1976, p. 36).

As already mentioned, Farabi thought in the direction of the cognitive theorists who see the mind as a unitary system (McLelland & Rumelhart, 1986), a unitary network (Anderson, 1983) or as a further development of the cognitive processes (Piaget, 1980). Farabi believes that there is a logical unitary faculty (e.g., module) in the soul who makes the inner speech and external speech possible. It also creates sciences and knowledge and helps in the acquisition of language. This logical faculty is unique to humans and similar to a limb or organ of the body which grows gradually and makes inventions and discoveries on the part of human beings possible (Farabi, 2010, p. 62). We should bear in mind that Farabi's ideas are general issues regarding the nature of human beings, so they are not as rigorous as the theories and principles in modern psychology. His ideas can be considered as preliminary ones on which we, regardless of the ignorance and scholastic passivity of our national character in the past centuries, could have based our thoughts to establish the field of psychology and derive newer theories and principles out of it.

7. CONCLUDING REMARKS

The main focus of this paper was to compare and contrast Farabi's philosophico-linguistic ideas with those of the modern linguistics. The results of the study showed that there are outstanding, and at the same time, overwhelming similarities between Farabi's philosophico-linguistic ideas with the theories and principles in modern linguistics some of which are Phrase-Structure Grammar, the surface and deep structure, the Innate Hypothesis, the Language Acquisition Device, Universal Grammar, and the Modularity Theory. His innovations and discoveries to explain the phenomenon of language in comparison and contrast with the theories of the last century are as follows. First, in the analysis of the single and compound terms, Farabi speaks of the rules of word formation and the structure of a sentence, respectively. In Farabi's view, a sentence is a compound word which itself is composed of single terms including a noun phrase, a verb phrase, and a prepositional phrase. This approach towards the linguistic analysis of language is similar to Chomsky's Constituent Grammar in which a sentence is broken down into its various parts or constituents such as nouns, verbs, adjective, adverbs, prepositions, etc., as illustrated in a tree diagram. We should not forget that Farabi brings evidence from Arabic data and Chomsky from English; therefore different descriptions are made of the two language concerned. The Arabic language includes elements which are absent in English. For example,

Arabic general nouns who are known to the speaker and hearer take *al* in their initial position (e.g., *al-kitab*, meaning *the book*) while the same English nouns take article *the* in the example *the book*.

Secondly, in Chomsky's Universal Grammar, the common features of all languages are referred to as principles and their different features are called parameters. In a similar vein, Farabi, considers similarities or commonalities and differences for languages. Commonalities of languages (that is, principles), according to Farabi, are studied not in the science of syntax but in the science of logic. Logic for Farabi is a science which studies "the common features and states of all languages" (2010, p. 52). Thirdly, as mentioned in the main text of the paper, the language faculty is species-specific in the sense that it is only related to human beings. It is implied from this statement that animals are deprived of such a faculty. Chomsky embodies such ideas regarding the innateness of language in Universal Grammar, the Language Acquisition Device, and the Innateness Hypothesis. In the same vein, Farabi, in the third interpretation of the term logic, speaks of logic as a soul-centered faculty which makes the acquisition of language, knowledge, sciences, and skills possible. This faculty, according to Farabi, is a limb or organ which only belongs to human beings. It even exists in children, but not fully actualized yet. When it grows, it makes "acquisition of knowledge and correct thinking possible" (Farabi, 2010, p. 36). His ideas regarding this faculty of the soul bear amazing similarities with Universal Grammar, the Language Acquisition Device, and the Innateness Hypothesis of Chomsky with this exception that the ideas of Chomsky are only related to the module of language while those of Farabi are derived from the module of logic. Farabi, confining the modules of the soul to the single module of logic, remarks that the faculty of the speech is in the module of logic rather than the module of syntax, which is conceived by Chomsky. Chomsky, on the other hand, considers a set of modules for the mind and separates the module of language from the module of logic among other modules. He then derives the concepts of Universal Grammar, the Language Acquisition Device, and the Innateness Hypothesis from the module of language rather than the module of logic.

Fifthly, according to Chomsky's Transformational Generative Grammar, the surface structure of the sentences is the result of the application of the mental transformations to the deep structure so that the sentences make phonetic representations. In the first and the second interpretation of the term logic, Farabi refers to the existence of the concepts of the surface and deep structure. In the first interpretation of the term, he defines logic as the external speech which is actualized in the form of the actual sounds of the language (i.e., Chomsky's phonetic representation in the surface structure). In contrast, in his second interpretation of the term logic, he defines the term logic as the inner speech which seems to be equal to Chomsky's deep structure. According to both Farabi and Chomsky, transformations in the mind (Chomsky's term) or the soul-centered faculty (Farabi's term), bring the abstract and meaning-based deep structure of the sentences to the surface structure to have phonetic realization to be heard by the speakers. Chomsky's transformations are present in the module of the language in the mind, which is voiced from a psychological orientation while Farabi's faculty of the speech or thinking is in the module of logic in the soul, which is reiterated from a philosophical perspective. Lastly, the principles (commonalities of all languages) and parameters (the differing features of all languages) which Chomsky talks about in Universal Grammar are related to the module of syntax. Farabi takes a different perspective towards the principles and parameters. He stations the principles in the module of logic and relates the parameters to the science of syntax.

To sum up, it is not an easy job to thoroughly compare and contrast Farabi's ideas regarding the issue of language. One reason for this difficulty is that Farabi's ideas are issued from a dominantly philosophical perspective. We are not mistaken to conclude that the major concern of Farabi is philosophy rather than the mere linguistic analysis. At the time, language studies were carried out within the general context of philosophy. We should also bear in mind that

linguistics received its autonomy from philosophy in general and psychology in particular in 1928. Therefore, Chomsky was a linguist enjoying a huge legacy of the past in front of him. For this reason, his ideas and ideals are first purely linguistic, although they have cryptic touches of philosophy and logic.

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