

Characteristics of Theoretical and Applied Sciences Applied Linguistics and General Linguistics as Models

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Abstract:

Applied sciences developed more extensively during the twentieth century than ever before, to the point that nearly every scientific discipline came to have one or more applied branches. This development resulted from the scientific cooperation that emerged among various disciplines, whether closely or distantly related. Human beings, by nature, tend to prefer the practical to the theoretical because of their innate inclination towards what is useful and convenient.

This article discusses the characteristics and objectives of both theoretical and applied sciences, as well as the significance and scope of each. It proceeds from the problem of the confusion between what is theoretical and what is applied. Some studies are described in their titles as either theoretical or applied, although their content does not reflect such a classification. I shall therefore attempt to identify clear characteristics that distinguish theoretical research from applied research.

The article follows the plan outlined below: the emergence of applied linguistics, its concept and boundaries, its relationship with other sciences, and the characteristics and objectives of both applied and theoretical sciences.

Keywords: General linguistics, applied linguistics, characteristics of applied sciences.

1. Introduction

Many sciences are concerned with human linguistic activity. General linguistics, however, is the only one among them regarded as a theoretical science, since it seeks solely to enrich research and knowledge about language without concern for the practical returns of such research and knowledge. This distinguishes it from other disciplines concerned with linguistic activity, such as applied linguistics, speech and language pathology (orthophony), and automated language processing, among others, which seek to use linguistic data to solve existing problems. This is a fundamental distinction between the general linguist and other specialists. The general linguist's sole purpose is to understand language and its system and to collect data about it in order to satisfy scientific curiosity. Applied specialists then draw on these efforts in language teaching, language programming and processing, speech and language therapy, and dictionary compilation, among other fields.

This study arose from the evident confusion surrounding the classification of certain branches of science as either theoretical or applied. Lexicography is a case in point: some authors classify it under semantics one of the levels of general linguistics whereas others place it among the branches of applied linguistics, without relying on criteria that would ensure the validity of either classification.

The researcher analysed a substantial body of theoretical and applied studies drawn from several sciences and disciplines. From this analysis, a number of characteristics distinguishing applied research were identified, as opposed to a single characteristic distinguishing theoretical research. The

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study assumes that referring to these characteristics can help researchers classify their work more accurately.

The study adopted both the descriptive and historical methods. The former was used to identify the relevant characteristics, while the latter was employed to trace studies in the Arab intellectual tradition and examine the achievements of Arab civilisation in the classification of sciences.

The study reached the following conclusions:

a. Applied research is distinguished by four characteristics: interdisciplinarity, selectivity, purpose, and the development of solutions.

b. Theoretical research is distinguished by one characteristic: the ennoblement of the human intellect through enriching the sciences with knowledge and methods of analysis.

2. Applied Linguistics: A Historical Overview

There is no doubt that the findings of linguistic studies have been put into practice for centuries. The Chinese, Babylonians, and Arabs made use of them in compiling dictionaries, while Indians and Arabs benefited from theoretical phonetic studies in establishing the rules governing the recitation of their sacred texts. The Arabs also developed cryptology (the science of encryption)

¹, among other disciplines. However, the term “applied linguistics,” denoting an independent field of study, emerged during the early decades of the first half of the twentieth century.

The term appeared in British universities in 1946, when applied linguistics became an independent subject at the English Language Institute of the University of Michigan. The Institute specialised in teaching English as a foreign or second language under the supervision of two prominent scholars, Charles Fries and Robert Lado. It subsequently began publishing its well-known journal, *Language Learning: A Journal of Applied Linguistics*. In 1958, the School of Applied Linguistics was established at the University of Edinburgh, one of the most renowned universities specialising in this field. The university also offers a distinctive programme in this discipline bearing its name.

The emerging discipline began to spread across many universities worldwide in response to a growing need for it. The International Association of Applied Linguistics (AILA) ²was founded in 1964. By the end of the twentieth century, it comprised more than twenty-five national associations of applied linguistics from around the world. The Association organises an international congress every three years, at which the latest research and studies are presented. ³

1. Its Concept

“Applied linguistics,” or *la linguistique appliquée*, is a compound term consisting of two components: linguistics and application.

a. Linguistics: A science whose subject matter and objective ⁴are the study of language in its various phonetic, morphological, syntactic, and semantic aspects.

b. Application: Putting knowledge into practice in order to solve a particular problem or issue; it may also be defined as the ability to apply given knowledge to specific, concrete situations. ⁵

From the concepts of linguistics and application, it follows that applied linguistics consists in applying some of the knowledge accumulated about the phonetic, morphological, syntactic, and semantic nature of language within a specialised, non-linguistic field such as computer science, psychology, or education. In other words, applied linguistics studies language from its various phonetic, morphological, syntactic, and semantic perspectives while focusing on the practical benefits of such study in different areas of individual and collective life.

It is therefore concerned with proposing solutions to the problems encountered by specialists in other sciences whose work involves language, such as psychologists and phoniatrists. At the same time, applied linguistics draws upon the findings of these specialists to broaden the knowledge of linguists and others regarding the nature of language. Its fields of inquiry have consequently expanded to include computer science through computational linguistics; general pathology through orthophony, pathological linguistics, or clinical linguistics⁶; education through language teaching and educational linguistics; language policy and planning; and law through forensic linguistics, among other fields.

Researchers have proposed numerous definitions of applied linguistics, including the following:

a. The use of available knowledge about the nature of language in order to improve the efficiency of a practical activity in which language is the essential component.⁷

b. Applied linguistics is the academic field of knowledge that investigates the relationship between knowledge about language and decision-making in the real world.⁸

c. Applied linguistics is a field or discipline informed by multiple sources, whose findings are used to identify and address linguistic problems.⁹

d. The use of the methods and findings of linguistic theories to solve certain language-related problems in non-linguistic fields. Its scope is extremely broad and includes foreign-language teaching, national-language teaching, speech disorders, translation, lexicography, stylistics, reading instruction, and other areas.¹⁰

Since the name of this discipline consists of two terms “linguistics” and “applied” some may assume that it is merely the application of findings derived from linguistics and certain related sciences. This assumption, however, is not entirely correct. In my view, there is a considerable difference between application, which is based on implementation and concrete practice, and theory, which constitutes one of the most important aspects of research in theoretical science.

Moreover, applied science possesses its own theories and methods. It develops these independently so that it may address its issues properly and autonomously. Otherwise, what value would there be in a discipline wholly dependent upon another, and what justification would remain for considering it an independent branch?

Applied science is also selective: it does not adopt all the information and theories offered by theoretical science. Rather, it selects those that serve its immediate practical purposes and may modify them according to the demands of reality, necessity, and society. Furthermore, applied linguistics enriches general linguistics with findings reached by other sciences in the field of language.

Applied linguistics also seeks to answer questions that may not attract the attention of theoretical linguistics. An education specialist, for example, might ask whether Arabic, English, or another language should be regarded as a mother tongue or a second language for speakers of some of its local dialects. The applied linguist would respond that a language learned from one's parents or immediate environment, without prior formal instruction, is called a mother tongue or first language (L1). A language learned at school but not acquired from one's surroundings as is the case with Arabic in contemporary Arab societies is called a second language (L2). By contrast, a language learned at school by a person who does not speak any of its dialects and for whom it is not a mother tongue is called a foreign language.

When preparing to teach a particular language or address an educational problem related to it, the applied linguist observes fundamental differences between learners for whom that language is a first language and those for whom it is a foreign language. These differences concern the relative ease

or difficulty of learning or mastering the language. The applied linguist must therefore design a separate instructional programme for each group, according to the findings of contrastive analysis.

3. Objectives of Theoretical and Applied Sciences

Early Arab scholars classified the sciences into theoretical and applied sciences, following the example set by the Greek philosophers. This classification was based on the objectives of each category. Dr Ibrahim Muhammad Ibrahim Saqr states:

“Aristotle’s commentators, including Alexander of Aphrodisias, Ammonius, Simplicius, and Philippus, conventionally divided philosophy into two major branches: theoretical science and practical science. ¹¹Theoretical science is concerned with an end that consists in truth that is, truth is pursued for its own sake, without regard to any practical benefit. Practical science, by contrast, is primarily intended to achieve practical benefit.” ¹²

Arab philosophers believed that classifying the sciences helped learners study the most essential disciplines before those of lesser necessity. In other words, such classification contributed to building an educational system capable of advancing both the individual and society. This is particularly evident in the work of Al-Kindi. In his classification of the sciences, for example, he placed mathematics first, followed by the other philosophical sciences, such as logic, the natural sciences, and metaphysics. As he pointed out, studying mathematics before the other philosophical sciences was both necessary and fundamental, since it enabled learners to arrive at a proper understanding of the remaining sciences. ¹³

Through his classification of the sciences, Al-Farabi (870–950 CE) sought to draw learners’ attention to the importance of:

a. Studying the subjects and details addressed by each science; that is, defining the subject matter of each discipline so that it is not confused with another.

b. Studying the relationships connecting the sciences to one another. ¹⁴This represents one aspect of what applied sciences seek to accomplish in the present age.

The benefits Al-Farabi attributed to the classification of the sciences may be summarised as follows:

a. Identifying the branches of each science separately: Al-Farabi states:

“Our purpose in this book is to enumerate the well-known sciences one by one, to explain in general terms what each of them contains, to identify the branches of those sciences that have branches, and to provide a general account of what each branch comprises.” ¹⁵

Educational guidance: Al-Farabi regarded the classification of the sciences as an essential introduction to learning, a necessary source of insight for anyone wishing to pursue a particular discipline, and an important means of understanding the expected benefit of acquiring it. He states:

“The contents of this book are useful because, when a person wishes to study one of these sciences and examine it, they will know what they are about to undertake, what they will investigate, what their inquiry will yield, what purpose it will serve, and what virtue may be attained through it. Their pursuit of the science will thus be based on knowledge and insight rather than blindness and uncertainty.” ¹⁶

b. Determining the value of the sciences: It is evident that a person cannot recognise the value of one science in isolation from all others. Comparison is therefore necessary for advantages to become apparent and shortcomings to be revealed. Al-Farabi states:

“Through this book, a person can compare the sciences and thereby determine which is superior, which is more useful, which is more precise, reliable, and powerful, and which is frailer, less reliable, and weaker.”¹⁷

c. Assessing expertise: ¹⁸The classification of the sciences provides a standard by which the competence of those working in a particular discipline may be assessed. It also makes it possible to determine the extent of their familiarity with all its principles and branches. ¹⁹Al-Farabi states:

“It is also useful for exposing anyone who claims to possess knowledge of a science when this is not the case. If such a person is asked to provide a general account of that science, enumerate its branches, and summarise what each branch contains, but proves incapable of doing so, the falsity of the claim becomes evident and the deception is revealed. It also makes it possible to determine whether someone proficient in a science has mastered it in its entirety or only some of its branches, and the extent of that mastery. It is likewise useful to the well-educated and widely cultivated person whose aim is to acquire a general acquaintance with the contents of every science, as well as to anyone who wishes to resemble scholars so that others may believe them to be one of their number.”²⁰

4. Objectives of Applied Linguistic Research²¹

Applied linguistics generally aims to:

Make use of the findings of theoretical sciences to improve professional competence, such as by facilitating translation or language teaching.

Integrate linguistic knowledge with knowledge from non-linguistic disciplines. This integration has led to the emergence of various branches of applied linguistics.

Develop innovative approaches to linguistic thought so that language may keep pace with contemporary advances.

Solve the problems encountered by language users across different fields of specialisation.

5. Features and Characteristics of Applied Science

Applied research possesses several characteristics that are not found in theoretical studies. These are as follows:

a. Interdisciplinarity

Interdisciplinary studies are applied studies in which different disciplines and branches of science interact to address a particular scientific issue from multiple perspectives. They seek to overcome problems encountered within a given science and to benefit from the achievements of other fields, thereby saving time and effort and achieving objectives with greater efficiency. This cannot be accomplished without cooperation among different disciplines.

The term “Interdisciplinarity” consists of two components:

Inter, meaning “between.”

Discipline, which literally means a system, but here refers to the various systems of knowledge or fields of study.

The term “Interdisciplinarity” therefore denotes cooperation between two or more fields of scientific study.

From this perspective, Klein and William Newell define interdisciplinary studies as:

“Studies that draw upon two or more leading or scientific fields of knowledge in order to answer certain questions, solve particular problems, or address a subject so broad that it cannot be adequately dealt with through a single discipline or field of specialisation.”²²

b. Selection or Choice

Applied scientists require only the knowledge that contributes to solving the problems they face. It would therefore be pointless for them to consult information and knowledge that do not serve their stated objectives. A language teacher, for example, does not teach the entire language at once. Instead, the teacher considers the learners' educational level primary, middle, secondary, or university and selects for each level a set of grammatical rules and linguistic knowledge suited to the learners' capacity for comprehension. Appropriate teaching methods are likewise selected according to each level. In language didactics, this is known as the method of content selection and organisation.

Dr Abduh Al-Rajihi states:

"It is self-evidently impossible to teach an entire language. We are therefore compelled to teach only parts of it. This natural principle necessarily imposes another principle: the principle of selection. Since one cannot take the whole and must instead take only part of it, which parts should one select?"

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To clarify further the concept of selection, we may consider the example of a chemist and a seawater-desalination specialist. A chemist undoubtedly possesses extensive knowledge of the chemical properties of various known liquids. The desalination specialist, however, needs only knowledge of the properties of seawater and fresh water, since these are directly related to the practical nature of the specialist's work.

c. Defining the Objective

It would likewise be pointless for applied scientists not to define their objectives, since the nature of their field requires them to solve a particular problem. Without a clearly defined objective, it would be impossible to propose appropriate solutions. This represents a fundamental difference between applied and theoretical science. The latter does not identify problems for the purpose of solving them in this manner; rather, its primary concern is the discovery of scientific truths.

Dr Ibrahim Muhammad states:

"The theoretical sciences seek knowledge for its own sake, whereas the practical or applied sciences seek knowledge for a further purpose beyond knowledge itself, namely action or practical conduct." 24

Dr Bertil Malmberg similarly defines the objective and draws a distinction between theoretical and applied research:

"The usefulness of any discovery or its scientific application is a secondary consequence and can never constitute its original objective. Scientists work in order to deepen their knowledge of nature and humanity. The scientific findings that have proved most beneficial in physics and medicine were invariably obtained without any thought of their possible usefulness. Scientific application has always been an unexpected outcome of research conducted with no purpose other than satisfying the scientist's curiosity." 25

At the first stage of primary education, for example, a language teacher may set the objectives of enabling pupils to pronounce the letters of the alphabet correctly, articulate words and short sentences, and represent what they hear using appropriate written symbols.

At university level, however, the objectives are different. Students must acquire knowledge of the literature written in the language under study and of the various branches of linguistics, including syntax, morphology, semantics, lexicography, and phonetics. They must also master the skills associated with the language they are learning, including speaking, listening, writing, and expression.

In addition, they must become familiar with language-teaching methods, since holders of a bachelor's degree are qualified to teach the language in which they obtained that degree.

For this reason, students are required to complete annual research projects in their prescribed courses, as well as a final dissertation. These research projects and the dissertation develop their ability to work systematically and seek out knowledge. This, in turn, prepares them for organised professional work requiring continuous and sustained research, such as teaching a national language to its native or non-native speakers.

d. Identifying the Problem and Developing Appropriate Solutions

Professor Michael McCarthy explains the importance of identifying problems and developing solutions in applied science as follows:

“Professionals working in the many occupations in which language plays a role in one way or another frequently encounter numerous problems in their daily work. Their experience may suggest that no direct or obvious solution exists for such problems. It may later become apparent, however, that one way of addressing them is to draw upon theoretical linguistics. Linguistics is believed to be capable of providing insights into and solutions for language-related problems under a variety of circumstances and in different contexts. This belief constitutes the foundation upon which applied linguistics rests. Applied linguists seek to find solutions to problems involving language.”²⁶

A language teacher may notice, for example, that a pupil cannot pronounce the /r/ sound correctly. After examining the pupil, a speech specialist may conclude that the difficulty results from inadequate learning rather than a physiological disorder. The language teacher would then devise an appropriate solution, such as asking the pupil to pronounce words containing the /r/ sound while providing guidance on its correct articulation. The pupil may subsequently be asked to provide further examples containing the same sound.

It should be noted that the Arab linguistic tradition did not neglect the question of application. Several applied sciences emerged within it, including lexicography, cryptology, and the science of Qur'anic recitation (tajwīd), which corresponds to the study of phonetic performance in modern applied phonetics. The latter represents the applied dimension of the science of Qur'anic readings.

The science of Qur'anic readings provides tajwīd with the theoretical foundations that enable the reciter to achieve the proper performance of the Holy Qur'an. It examines variations among Qur'anic words, modes of recitation, and the chains of transmission of the readings in terms of their authenticity and recurrent transmission. Tajwīd, by contrast, does not investigate variations among Qur'anic words; it is concerned solely with how they should be pronounced correctly.²⁷

Scholars of tajwīd therefore identified:

- a. The objective: teaching the correct pronunciation of the sounds of the Holy Qur'an.
- b. The problem: the widespread occurrence of pronunciation and recitation errors in the performance of the Holy Qur'an.
- c. The relevant knowledge: they selected suitable information from the studies of Arabic sounds produced by lexicographers and grammarians, particularly the identification of points of articulation and phonetic characteristics. They also added other topics required by the applied method, such as rules governing the interaction of sounds and the study of recitation errors.
- d. The solution: identifying recitation errors and explaining their causes so that reciters may avoid them, while training them in correct performance.

6. Features and Characteristics of Theoretical Science

It may be observed that theoretical science seeks to gather extensive information about the phenomena under investigation, since it aims to uncover facts as they are, without modification or prior direction. Its primary purpose is also to satisfy researchers' intellectual inclinations and to ennoble the human intellect.²⁸

For this reason, many of its questions have been raised and revisited repeatedly and have remained the subject of considerable debate. One may therefore ask what practical benefit or application such questions provide, other than elevating human beings and honouring them above other creatures. We must consequently reject outright the claim that theoretical research represents wasted effort or consumes resources that would yield greater economic benefits if devoted to practical applications. In my view, this position is justified by the following considerations:

a. The fundamental mission of science is to ennoble human beings.

b. Theoretical research is essential to applied research, but the reverse is not necessarily true, since applied research draws upon the findings of theoretical research. For this reason, some scholars refer to theoretical research as basic research,²⁹ thereby emphasising its indispensable role in making applied research possible.

c. Knowledge that has no practical application today may acquire one in the future.

d. The abundance of information produced by theoretical research results from the differing perspectives, cultural backgrounds, and motivations of researchers. Phonetics, for example, developed among Indians and Arabs because of the existence of sacred texts. Philosophy developed among the Greeks because of the aristocratic nature of their society, which regarded professions and practical occupations as the work of enslaved people rather than that of masters, whose duty was to devote themselves to thought.

e. The selection imposed by practical application is temporary and dependent upon society's immediate needs. Since these needs are constantly changing, the process of selection must be renewed in response to emerging circumstances.

f. Practical application is incidental. The usefulness of scientific research and its applications does not constitute the ultimate purpose of researchers, whose work is directed towards deepening knowledge within their respective fields. Practical application is therefore an unintended outcome of research undertaken primarily to satisfy scientific curiosity. Bertil Malmberg states:

"The debate concerning the usefulness of scientific research in its various forms is, in fact, contrary to the very spirit of science. The usefulness of any discovery or its scientific application is a secondary consequence and can never constitute its original objective. Scientists work in order to deepen their knowledge of nature and humanity. The scientific findings that have proved most beneficial in physics and medicine were invariably obtained without any thought of their possible usefulness. Scientific application has always been an unexpected outcome of research conducted with no purpose other than satisfying the scientist's curiosity."³⁰

7. Conclusion

In conclusion, the distinction between theoretical and applied science becomes clearly apparent through the characteristics and objectives that distinguish each of them. These characteristics constitute epistemological criteria that may be used to classify theoretical and applied sciences alike.

Research into the classification of the sciences opens the way for an epistemology of classification to be examined not only from a philosophical perspective, but also from methodological and educational perspectives. From a methodological standpoint, every theoretical or applied branch

possesses methods consistent with its characteristics and objectives. From an educational standpoint particularly in relation to the teaching of subjects and sciences instruction is organised according to their objectives and on the basis of whether the relevant science or subject belongs to the theoretical or applied domain. Accordingly, due consideration must be given to the selection of appropriate methods, teaching aids, and theories.

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¹ Ibn Wahshiyya al-Nabati established principles for deciphering ancient and secret scripts in his book *The Long-Awaited Fulfilment of the Desire to Understand the Symbols of Scripts*. The discipline later became known as *‘ilm al-ta‘miya* the science of cryptology and is referred to in the modern era as cryptography or watermarking. For further details, see Ibn Wahshiyya al-Nabati (d. 350 AH), *The Long-Awaited Fulfilment of the Desire to Understand the Symbols of Scripts*, a manuscript published in Iyad Khalid al-Tabba‘, *Methods of Manuscript Editing* (Damascus: Dar al-Fikr, 1st ed., 2003); Muhammad Miriyati, Yahya Mir Alam, and Muhammad Hassan al-Tayyan, *Cryptology and the Decipherment of Codes among the Arabs*, Vol. 1: A Study and Critical Edition of the Treatises of al-Kindi, Ibn Adlan, and Ibn al-Durayhim (Damascus: Publications of the Academy of the Arabic Language; year of publication not specified); and *Cryptology and the Decipherment of Codes among the Arabs*, Vol. 2: Encryption and Cryptanalysis A Study and Critical Edition of Eight Manuscript Treatises (Damascus: Publications of the Academy of the Arabic Language, 1st ed., 1997).

² An abbreviation of Association Internationale de Linguistique Appliquée.

³ See Abduh al-Rajihi, *Applied Linguistics and the Teaching of Arabic* (Alexandria: Dar al-Ma‘rifa al-Jami‘iyya, 1995), pp. 8–9.

⁴ General, or theoretical, linguistics aims solely to study language in and of itself in order to satisfy human scientific curiosity. It is not concerned with how linguistic knowledge may be used or applied in life, as this is the function of applied linguistics.

⁵ Baghdad Lakhdar, *Questioning in Pedagogy* (Algeria: Thala Publications, 1999), p. 142.

⁶ Al-Khalil called sound, eloquent, and faultless speech *billat al-lisān*. He states:

“*Billat al-lisān* means that the tongue reaches the correct points of articulation and proceeds steadily in speech. It is said: ‘How excellent is the billa of that person’s tongue, or: the tongue falls only upon its proper billa.’ It is also said that a person *balla*, *aballa*, or *istaballa* from illness, meaning that the person recovered; the corresponding noun is *al-bill*. When someone’s condition improves after emaciation, it is said that the person has *ibtalla* or *taballala*. *Balbala* also refers to the confusion of different tongues. It is said and God knows best that when Almighty God wished to make the tongues of the descendants of Adam different from one another, He sent a wind that gathered them from every region at Babylon. There, God confused their tongues, after which the wind dispersed them throughout the lands.”

Al-Khalil ibn Ahmad, *Kitāb al-‘Ayn*, Vol. 1, pp. 161–162. This biblical account gave rise to the term *le babélisme*, which in modern linguistics refers to linguistic diversity and variation. See Wael Barakat, *Concepts in Textual Structure* (Damascus: Dar Ma‘add, 1st ed., 1996), p. 14, with minor adaptation.

Drawing on this designation, the Centre for the Development of the Arabic Language in Bouzaréah, Algeria, coined the term *‘ilm al-tablīl* to refer to the science that studies and treats language and speech disorders, known in psychology departments as orthophony. We studied this subject *‘ilm al-*

tablīl at Ferhat Abbas University in Sétif in 2003, in the Department of Applied Linguistics, under the supervision of Professor Azzedine Sahraoui.

The term ‘ilm al-tablīl is preferable because it refers to the state of health to which a person returns after illness. It is more comprehensive than orthophony, which literally means the correction of pronunciation. The purpose of ‘ilm al-tablīl is undoubtedly to assist and rehabilitate people affected by language and speech disorders. As is evident, the term derives from the expression billat al-lisān, cited by al-Khalil above. See Redha Bireche, *The Foundations of Phonetic Theory among Early Arab Phoneticians: A Contemporary Linguistic Perspective*, doctoral dissertation defended in 2018, manuscript held by the Department of Arabic Language, University of Batna, p. 167.

⁷ Abduh al-Rajihi, *Applied Linguistics and the Teaching of Arabic*, p. 12.

⁸ Guy Cook, *Applied Linguistics*, trans. Yusuf bin Abdulrahman al-Shammari (King Saud University Publications, 2008), p. 190.

⁹ Abduh al-Rajihi, *Applied Linguistics and the Teaching of Arabic*, p. 13.

¹⁰ Hilmi Khalil, *Studies in Applied Linguistics* (Alexandria: Dar al-Ma‘rifa al-Jami‘iyya, 2002), p. 74.

¹¹ The concept of practical science among early Greek and Arab scholars closely resembles what modern scholars call applied science, as can be seen in the early definitions of practical science and in their identification of its branches and benefits. This point will be explained shortly.

¹² Ibrahim Muhammad Ibrahim Saqr, *Philosophical Problems* (Cairo: Dar al-Fikr al-Arabi, 1997), pp. 104–105.

¹³ See Ibrahim Saqr, *Philosophical Problems*, p. 107.

¹⁴ See Ibrahim Saqr, *Philosophical Problems*, p. 113.

¹⁵ Al-Farabi, *The Enumeration of the Sciences*, introduced, explained, and arranged by Ali Bou Melhem (Beirut: Dar wa Maktabat al-Hilal, 1st ed., 1996), p. 14.

¹⁶ Al-Farabi, *The Enumeration of the Sciences*, p. 16.

¹⁷ Al-Farabi, *The Enumeration of the Sciences*, p. 16.

¹⁸ Evaluation is the act of making a judgement about a specific matter on the basis of previously established criteria. A skill is the ability to perform tasks and activities rapidly, accurately, and proficiently.

¹⁹ Atif al-Iraqi, *Philosophical Problems* (Cairo: Dar al-Fikr al-Arabi, 1997), p. 116.

²⁰ Al-Farabi, *The Enumeration of the Sciences*, p. 16.

²¹ After examining several books on applied linguistics, I found that their discussions generally pursue these objectives.

²² See Radia Ben Ariba, *Lectures in Computational Linguistics* (Constantine, Algeria: Alpha Documents Publications, 1st ed., 2017), p. 35.

²³ Abduh al-Rajihi, *Applied Linguistics and the Teaching of Arabic*, p. 37.

²⁴ Ibrahim Muhammad Ibrahim Saqr, *Philosophical Problems* (Cairo: Dar al-Fikr al-Arabi, 1997), p. 105.

²⁵ Bertil Malmberg, *Phonetics*, p. 191.

²⁶ Michael McCarthy, *Issues in Applied Linguistics*, trans. Abdel-Gawad Tawfik Mahmoud (Supreme Council of Culture, 1st ed., 2005), p. 19.

²⁷ See Ibrahim bin Saeed al-Dosari, *A Dictionary of Terminology in the Sciences of Tajwīd and Qur’anic Readings* (Imam Muhammad ibn Saud Islamic University Publications, 1st ed., 2007), p. 7.

²⁸ See Ahmed Mukhtar Omar, *The Study of Speech Sounds*, p. 401; and Bertil Malmberg, *Phonetics*, p. 191.

²⁹ Basic, or theoretical, research is research directed towards uncovering the correlations between real sensory experience and conceptual structure in a manner that produces coherent and convincing findings. Applied research, by contrast, derives from the findings of basic research and is directed towards applying those findings in processes that provide practical benefits. See *Dictionary of Psychology and Education*, Academy of the Arabic Language in Cairo (Egypt: General Authority for Government Printing Affairs, 1984), p. 94.

³⁰ Bertil Malmberg, *Phonetics*, p. 191.