

The Acoustic Efforts of the Medieval Arab Philosophers: Brethren of Purity as a Model

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Abstract

This study discusses the acoustic efforts of the Medieval Arab philosophers and thinkers, and explain specifically the efforts of Brethren of Purity (ikhwān al-safā) also The Brethren of Sincerity). They were a famous secret society of Muslim philosophers in Basra, Iraq, in 4th century HD/8th century CE. The structure of this mysterious organization and the identities of its members have never been clear. This study is an overview of the reality and the actuality of the vocal acoustic research which the Arab thinkers produced. It also will discuss the efforts of Al-Safa brothers community in the Arab Acoustic field, who presented a logical definition of the linguistic sound, then started to categorize the sound according to the meaning, quantity and quality, determined the sounds articulation and the ways of its production, then they made a great analysis on the ways of analyzing it based on all the qualitative and quantitative levels, and highlighted the semantic aspects and the ways of recognizing and perceiving the sounds.

Keywords

Ekhwan Es-Safa, The Brethren of Purity and Sincerity, Acoustic phonetics, phonetic transcription

1. Introduction

The phrase “Language and thought are two sides of the same coin” is a saying which is often beaten into the heads of the scholars of philosophy and linguistics. Although thought cannot be imagined without a language that embodies its content, language cannot be correctly visualized without understanding all the stages of the cognitive process. In such a way, language develops and keeps up with the cognitive storage to be able to express it properly.

While human beings have duality of mind and natural devices which enable them to produce and recruit simultaneous cognitive and linguistic processes, the relation between utterances and propositions is still considered one of the most complex, yet interesting branches of linguistics. Academically speaking, language is only signs that determine concrete or abstract experiences. It is

also a way of expression and a means of communication. However, thought is always changeable because of some external factors, the new technology and the prosperous society. Therefore, language must cope up with the progress of thought.

Because of the different schools of philosophy, there are various theories which describe the relation between language and thought. On the one hand, some of them state that language is separated from thought because each of them has its own nature and function. According to these theories, language does not affect thought. It is also not influenced by it. Thus, language and thought are unrelated.

On the other hand, there is a relation between language and one of the important components of thought, which is the broad definition of culture. According to this definition, culture is a system of social beliefs, ethics, values, and behaviours. Its relation with language is one of extreme amalgamation which often leads to homogeneity. It is also the vessel of thought which can be produced or expressed only by language.

This study attempts to collect Arab linguistic efforts of a philosophical group which emerged in Baghdad during the renaissance in the tenth century A. D. It offers a complete linguistic philosophical view which needs to be discovered by researchers and presented to the scholars of linguistics in the modern age.

2. Literature Review

Hassan Bashir Saleh (2013) indicated a study on the relationship between logic and language of Muslim philosophers in the Middle Ages. He explained that many of the philosophers during that time in linguistic contributions are far less important compare to the language specialists books, although it differs in term of supply side and objectives of the study.

Ahmad Mukhtar Omar (2000), discussed audio language study and compare between the modern acoustic studies and the traditional Arab linguists studies. While Ahmed Ragheb Ahmed (2012), discussed a group of language lesson issues between theory and application and displayed the efforts of group of medieval philosophers which include Brethren of Purity with an analysis of their views by the modern technical means.

Abraham Madkour (1991) gave a study entitled: "Aristotelian logic and science of words and jurisprudential" and pointed to the impact and vulnerability relations between philosophers and linguists in the Middle Ages.

3. History of Acoustic Phonetics in the Arab World

The origins of phonetics in the Arab world refer back to the renaissance in the second century A. H. Basically, studying phonetics has a practical purpose. Its main principals were one of the fundamentals of many Arabic disciplines such as grammar, morphology, syntax, semantics, literature, rhetoric, criticism, etc.

With respect to the efforts of Arab linguists, "phonetics is founded by Al-Khalil Ibn Ahmad, defended

by his student Sibawaih, and ripened by Ibn Jenni”, one of the scientists in the fourth century A. H.¹

Despite the fact that some people are under the illusion that all linguistic studies are conducted only by linguists, much available research and various resources indicate and substantiate the role of Arab thinkers and philosophers to explain or establish different approaches to Arabic linguistics. No one can deny the efforts of Ibn Sina, Ibn Khaldun, Ekhwan Es-Safa, Ibn Rushd, Al-Batalaiosi, and others in the field of Arabic linguistics.

This study sheds light on a group of those thinkers to show the origins of their role and illustrate their view in the field of Arabic linguistics.

Although it is thought that there was no clear information about the definition of sound in the old tradition, Markos Bolio, a Roman architect during the first century BC, found significant remarks regarding this issue and supposed some intelligent guessings related to echo and noise. The first universal effort to describe sounds was made by Muslim linguists in the fourth century A. H./the tenth century A. D. Muslim phoneticians describe the vocal tract and call it (the talking machine). They deal with acoustic phonetics and the place and manner of articulation.

“Of course, voice is a phenomenon which occurs with the flow of the airstream to articulate in the throat, the mouth, or the lips. These articulations are called letters. The sound of each letter differs from the other according to its articulation”, Ibn Jenni said.²

4. Ekhwan Es-Safa’s Definition of Sound

The definition of sound was introduced by Ekhwan Es-safa³ in the fourth century A. H. the tenth century A. D. “Voice is not produced when two soft objects collide because the airstream passes smoothly. It is only produced in case of two hard object collision because the airstream ceases and vibrates in the six directions”. Ekhwan Es-Safa stated in their epistles.⁴

¹ See Dr. Abu Sakeen, Abdel Hamid Muhammad, *Derasate Fet’agweed Wadl-Aswat Al-Lughaweya*, [Studies in Phonetics and Intonation], Al-Amana Printing House, Cairo, 1404 A.h/1983 A. D. P. 14.

² See Serr Senaate El-Erab, [The Secret of parsing], Ibn Jenni, Edited by Dr. Hassan Hendawi, Al-Kalam publishing house, Damascus, 1st Ed. 1985 A. D. 1/6).

³ (Ekhwan Es-Safa, or the brethren of purity and sincerity, are a secret group of muslim philosophers in Baghdad in the second half of the third century A.H. They collect the scientific, philosophical, and religious knowledge of their age in more than fifty epistles, or *rasa’il*, to form something like the encyclopedia. These epistles are divided into four parts; math, physics, psychology, and theology).

Among this group, one can mention five figures: Muhammad Bin Mashar El-Basty, whose neck name is Al-Mukaddes, Abu Al-Hassan Ali Bin Harun Az-Zengani, Muhammad Bin Ahmad An-Nahragani Al-Awfi, and Zaid Refaa. The group is based on sacredness and purity. It establishes a doctrine that combines different fields. They claim that this doctrine leads to Allah’s satisfaction.

⁴ See *Rasa’il Ekhwan Es-Safa* [The Brethren of Purity and Sincerity’s Epistles], Electronic version, p. 61,

In his book, *Al-Shifa'*, or the book of healing, Ibn Sina⁵ explains that plosive sounds result from blocking the air. However, fricative sounds are produced by forcing air through a narrow channel made by placing two articulators close together. In both cases, voice is produced from air vibration. As for plosives, the air is blocked then ceases in all directions. As for fricatives, the air passes gradually through a narrow opening.

5. A Taxonomy of Sounds in Terms of Meaning, Quality and Quantity

Ekhwan Es-safa develops a taxonomy of sounds in terms of meaning, quality and quantity. As for meaning, sounds are divided into two types: meaningful and meaningless. Meaningful sounds are the sounds of animals whereas meaningless sounds are the sounds of all entities such as stones, clay and metals. Animal sounds are also divided into two types: verbal and non-verbal. Non-verbal sounds are the sounds of the non-talking animals. They are called sounds not speech. They are called speech only if the sound can be articulated and organized into coherent letters which can be uttered clearly in distinct syllables. Therefore, verbal speech is represented in order and authorization, giving and taking, buying and selling and other non-animal affairs. This is the difference between sound and speech.⁶

Not only does Ekhwan Es-Safa distinguish between verbal and non-verbal sounds, but also classify non-verbal sounds into two subcategories: natural and mechanical. According to them, "there are two

Al-Warraaq Website. www.alwaraq.com

⁵ Abu Ali Al-Husayn Ibn Abd Allah Ibn Al-Hassan Ibn Ali Ibn Sina, known by Ibn Sina, is a philosopher and physician in the fourth and fifth centuries A. H./the eleventh century A. D. He was born in the village Afshana near Bukhara (now in modern Uzbekistan).

Ibn Sina was brought up in a united family; his father was from Balkh. He went to Bukhara during the rule of Prince Nuhibn Mansur, where he worked in a village in Bukhara called Khrmitn, but he lived in Avhna because it was near his work. He has chosen his wife Sarah from this village. They gave birth of two sons. The older one is Ibn Sina. Then, the family moved to Bukhara.

As for his contribution in physics, it appears in his books of *Al-Shifaa* (the book of healing), *Al-Nagah* (deliverance), and *Al-Isharat* (signals). Ibn Sina combines Greek and Islamic philosophy. He is one of those who rejected the idea of turning base metals into gold. He Also studied several natural phenomena such as rainbow and The image formation by light reflection to the eye. He discussed the concept of infinity and found that the speed of light is infinite. His contributions also include studying the relationship between time and movement, conducting experiments and measurements to calculate the gravity of many materials and innovating a Thermometer based on the extension of trapped gas.

Despite Ibn Sina's inimitable mentality in medicine and other sciences, he was not interested in his own health. At the end of his life which is abounded by diseases, some of his servants tried to get rid of him to loot his money. When he felt that he is weak, he stopped curing himself until he died in Hamadan in 428 AH/1037 AD.

⁶ See Ekhwan Es-Safa's *Rasa'il*, The electronic version, p. 412.

types of sounds: animal and non-animal. Non-animal sounds are two types: natural, such as the sound of iron, wood, thunder, wind and other non-living things and mechanical, such as the sound of drum, toot, strings, etc”.⁷

6. Place of Articulation

Moreover, Ekhwan Es-safa tackles the place of articulation. According to them, “places of articulation are the lungs, the chest, the throat, the jaw and the mouth”. The voice of each animal depends on the size of his lungs and mouth; the wider the mouth, the jaw and the lungs, the higher the sound pitch of the animal. Regarding the animals which have no lungs, such as grasshoppers, cockroaches, and other insects, they buzz when they breath spreading their wings, opening their mouth and gulping in the air. Regarding dumb animals, like worms, serpents and so on, they have no lungs and consequently, they don't produce sounds.⁸

Not all human sounds can be considered phonemes; a phoneme must carry an intended meaning. “Concerning the sound of human animals, they are two kinds: verbal and non-verbal. Non-verbal sounds are the ones which have no spelling or articulation such as weeping, laughing, coughing, moaning and so on. On the contrary, verbal sounds are the ones which have spelling and articulation such as people's speech regardless of the language they use”.⁹

7. Qualitative Division

In terms of quality, Ekhwan Es-Safa divides sounds into eight types, each two of them facing each other: “great and small, rapid and slow, steep and thick, and bass and light”. As for great and small sounds, it is produced by Adding a number of sounds to each othersuch as the sounds of drums. The sounds of processions drums, if added to those of effeminate drums, they will be great, and if added to the sounds of thunder and lightning they will be small. Square is a great drum beaten in Khorasan borders when the starting war horn is heard. Its sound is heard at the distance of leagues. According to this example, sounds greatnessand smallness is considered by adding them to each other. As for The rapid and slow sounds, they are considered by adding them to other sounds, and the example is the sounds of dyer beats and black smith hammers. They are fast when adding to other sounds to them. As for adding to the sounds of mariner punts, They are fast when added to the sounds of painter and tailor punts and slow when adding to them. They are fast When added to the sounds of mariner punts. According to this example, the speed of the sounds is considered according to adding them to each other. When adding the steep and thick sounds to each other they became like the sounds of large jar click and its steepness. when adding dual clicks, and adding dual sound to triangle sound, and adding

⁷ See Ekhwan Es-Safa's *Rasa'il*. The Electronic version, p. 412.

⁸ See the same reference, p. 413.

⁹ See the same reference, the same page.

triangle sound to square sound, they become steep. On the contrary, when adding the triangle sound to the square sound, and the triangle sound to the dual sound, and the dual sound to that of large jar click, they became thick. On the other hand, the sound of each chord is also totally thick in addition to its Pursor its being Pursed. According to this measurement the soundsteepness and thickness are considered by adding them to each other.¹⁰

8. The Quantitative Classification

Ekhwan Es-Safa classifies sounds in terms of quantity into two types: Continuous and discontinuous. Discontinuous sounds are these sounds which are distinguished with a tangible stillness.

Rhythms of rails and flaps of tendons are clear examples of this type.

On the other hand, the sounds of flutes, drums, trundles and runnels and all the other sounds which share the same phonetic nature are some examples.

Of the continuous sounds.

This category of sounds is classified into two distinguished types; high pitch and low pitch sounds; the flutes and reed pipes which have wider.

Concavity and punctures produce lower pitch sounds, while those which have a thinner concavity and more narrow punctures produce higher pitch sounds.

It is clear that the closer punctures to the place of insufflation produce the higher pitch tones, while the furthestmost punctures.

Produce the lower pitch tones.¹¹

9. Pitch

Muslim scientists shed light on the definition of pitch. "Massive body collision is greater than small body collision because its air vibration is more frequent." The collision of two bodies with the same substance, shape and magnitude gives two equal tones. If the two collided bodies are soft, their sound is smoother than the sound of their mutual surface and airstream. If empty hard bodies, such as utensils and so on, are beaten, they give long tones, the air moves inside and hits their edge. The wider the body, the higher its pitch; the air moves a long distance. Besides, animals which have huge lungs, wide jaw and big mouth, have a loud voice. This is due to the fact that they breathe heavily. As mentioned above, pitch depends on the body and the movement of the air. The sound of thunder is the highest of all sounds.¹²

¹⁰ See Ekhwan Es-Safa's *Rasa'il*, the Electronic version, p. 61.

¹¹ See the same reference, the same page.

¹² See Ekhwan Es-Safa's *Rasa'il*, The electronic version, p. 427.

10. Sound Recognition

Ekhwan Es-Safa refer to the human capability of recognizing sounds, they emphasize that the human being can differentiate between the different sounds with recognizing the phonetic nature of the sound and the way of its own vibration, banging and the movement delivered to the sense of hearing, as all the sounds whether they are comprehensible or incomprehensible sounds and whether they are animal or non-animal sounds just a banging which occurs in the air as a result of a jostle between the bodies or which is produced in the throat of the animal, as the air—with its smooth nature, pure essence and the quick movement of its parts—penetrates all the bodies and permeates in them, attracting some bodies to the others.¹³

The sense of hearing enables the living creatures to recognize sounds. Thus, they use it because it always gives correct results because the air is the only medium between the sound and the ear. The confidence of this sense depends on the airstream. If the sound is produced in the wind, it may not be heard because the speed of the airstream. If sound waves are far from the airstream, it is not produced.¹⁴ Ekhwan Es-Safa also pays attention to the sense of hearing by which humans can discriminate sounds. They point out that each sound has its own “distinct tone”. The air carries the sound and transmits it to be heard and understood. As mentioned in the holly Kuran, that Allah “endowed you with hearing (ears), seeing (eyes), and hearts. Little thanks you give”.¹⁵

11. Conclusion

This study tackles efforts in phonetics by a well-known group of muslim philosophers in the Abbaside era. This group, known by Ekhwan Es-Safa, offer several philosophical cognitive linguistic aspects. The study reaches some facts as follows:

1. Ekhwan Es-Safa presents an acoustic description of the Arabic phonemes which is not different from the results of the modern linguistic analysis.
2. Ekhwan Es-Safa’s research in phonetics has a linguistic purpose. Yet, it is written in a philosophical language which resembles the language used when speaking about existence and metaphysics, cosmic, logic, and ethics.
3. Ekhwan Es-Safa study all the aspects of sound; they define sounds and classify them according to meaning, quality, and quantity. They also deal with the place and manner of articulation, followed by a wonderful explanation of the qualitative and quantitative levels of analysis. Moreover, they shed light on the meaning of sound and its audition.

¹³ See Al-Mugam Al-Waseet, p. 524.

¹⁴ See Al-Mugam Al-Waseet, p. 524.

¹⁵ See the same reference

Acknowledges

I would like to express my special thanks and deepest gratitude to International Islamic University Malaysia (IIUM), as well as our Research Management Centre (RMC) who gave me the golden opportunity to accomplish this wonderful research topic (The Acoustic Efforts of the Medieval Arab Philosophers Brethren of Purity as a Model). I would like to extend my sincerest thanks for your support and guidance throughout this research. Your continued support led me to gain so many information and knowledge.

Secondly, I would also like to thank my friends and students for your help, encouragement and continuous support in finalizing this project within the limited time frame.

References

- Al-Ani, S. (1970). Arabic Phonology: An Acoustical and Physiological Investigation, the Hague, Netherlands: Mouton and Co. In *Janua Linguarum* (practical series 61).
- Al-Bataliosi, Abu Muhammad Abdallah Ibn E. (2007). Rasa'il Fi Al-Lugha [Treatise in Language]. In W., Muhammad As-Saraqebi (Ed.), *King Faisal center for research* (Vol. 1).
- Anis, I. (1975). Al-Aswat Al-Lughaweyya [phonemes]. In *Anglo Library* (Vol. 5).
- Ashinida A., Afendi H., & Mohd. Shabri Y. (2004). Penggunaan PBBK (Pembelajaran bahasa berbantuan komputer) dalam pengajaran dan pembelajaran bahasa Arab sebagai bahasa asing: Satu tinjauan awal. *Journal of Language Studies*, 4(1), 1-20.
- Haddad, F. (2011). *Ibn Khaldun, Wa-Arah Al-Lughaweyya At-Talimeyya, Manshourat Mukhabbar Al-Mumarasate Al-Lughaweyya* [His linguistic and educational views: Treatises of practical linguistics]. Algeria.
- Helal, Abdel Ghaffar H. (1988). Aswat Al-Lugha Al-Arabeyya [Arabic Phonemes]. In *Egyptian Anglo Library* (Vol. 2).
- Hifny, Y. et al. (2004). ArabTalk: An Implementation for Arabic Text To Speech System. In *The proceedings of the 4th Conference on Language Engineering; the Egyptian Society of Language Engineering (ESLE), and re-published also in the News Letter of Evaluation of Language Resources and Distribution Agency (ELDA)*. France.
- Ibn J., & Abu Al-Fatah O. (1985). Serr Sena'ate Al-Erab [the secret of phonetics]. In H. Hendawi, Al-Kalam (Ed.), *Publishing Company* (Vol. 1). Damascus.
- Ibn M., & Muhammad Ibn Makram Ibn A. (1994). Lesan Al-Arab [the Arab's tongue]. In *Sader Publishing House* (3rd ed.). Beirut.
- Ibn S., & Abu Ali A. (1982). Asbab Hudooth Al-Harf [the reasons of letter occurrence]. In M. Hassan At-Tayyan, & Y. Meer Alam (Eds.), *The Academy of the Arabic Language*. Damascus.
- Mohd Feham Mohd G., & Isarji S. (2000). Online Arabic: Challenges, limitations and recommendations. *Proceedings of National Conference on Teaching and Learning in Higher Education* (pp. 231-239). Universiti Utara Malaysia, Kedah.

- Mohd Feham Mohd G. (2006). *The design, development and testing on the efficacy of a pedagogical agent on the performance and program rating scores among students learning Arabic* (Unpublished Ph. D. dissertation). Universiti Sains Malaysia.
- Muhammad Sabri S., & Ghazali Yusri Abd R. (2012). Online Vocabulary Games For Teaching And Learning Arabic. *Journal of Language Studies*, 12(3), 961-977.
- Muhammad Sabri S., & Nor Aziah A. (2011). A study on Malaysian language learners perception towards learning Arabic via online games. *Journal of Language Studies*, 11(3), 129-145.
- Noorizah, M. N., Hazita, A., Nor F., Mohd N., Afendi, H., & Nadzrah A. B. (2011). Development and evaluation of the Interactive English Language Literacy System (i-ELLS) for online reading comprehension. *The Southeast Asian Journal of English Language Studies*, 17, 19-30.
- Omar, Ahmad M. (2000). *Derasate As-Sawat Al-Lughawi* [the studies in phonology]. Alam Al-Kutob.
- Hartmann, R. R. K., & Stark, F. C. (1973). *Dictionary of Language and Linguistics*. London.
- Ragheb, A. (2007). Phonetic Accompaniment and its Semantic Reflections on the Holy Qur'an; A Computational Phonological Study (long Arabic essay). *Symposium on Information Technology and Arabic & Jurisprudent Sciences*. College of Computer and Information Sciences, University of Al-Imam Muhammad Ibn Sa'ud. Retrived from <http://www.imamu.edu.sa/ccsi/Arabic/a-home.htm>
- Ragheb, A. (2011a). *Phonetic Study between Theory and Practice*. Copy Express Press.
- Ragheb, A. (2011b). Program for teaching Arabic language. *International Journal Al-Madinah*.
- Ragheb, A. (2011c). *Phonetic Study between Theory and Practice*. Copy Express Press.
- Ragheb, A. (2011d). Program for teaching Arabic language. *International Journal Al-Madinah*.
- Ragheb, A. (2013). Program for teaching Arabic language. *Journal of Language Studies*, 13, 117.
- Shahin, Abdel S. (1977). *Al-Manhag As-Sawti Lel-Benia Al-Arabeyya* [phonetic methodology for Arabic morphology]. Cairo.
- Vincent, Pang, L., Kean W., Tan Choon K., & Syukery M. (2005). E-learning initiatives in e-ducating student teachers. *Journal of Language Studies*, 5(2), 15-27.
- Yaseen, M. et al. (2006). *Building Annotated Written and Spoken Arabic LR's in NEMLAR Project, LREC 2006 conference*. Genoa-Italy. Retrieved from <http://www.lrec-conf.org/lrec2006>
- Zamri, M., & Nur Aisyah Mohamad N. (2011). Persepsi Guru Tentang Penggunaan Aplikasi Multimedia Dalam Pengajaran Komponen Sastera Bahasa Melayu. *Journal of Language Studies*, 3(11), 163-177.