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MUSIC AS A SCIENCE OF MIND IN THE PHILOSOPHY OF AL FARABI

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Abstract. This article reviews how philosophical issues related to music can be informed by cognitive science approaches, particularly those of psychology and neuroscience. Focusing on activating emotions with the expressions of music, this study draws attention to an interdisciplinary field within the framework of philosophy. The first traces of issues associated with the depths of consciousness are found in Ancient Greek philosophy. Throughout human history, most philosophers have actively contemplated and attempted to answer fundamental questions about the universe and consciousness. The philosophy of music states that the art of music, each of the first foundations, involves the characteristic movement of the mind, which is summed up by fragmentation and synthesis (composition), according to the perception and imagination of the senses. Al Farabi, in his book The Great Book of Music, evaluates how certain features of musical rhythm, tonality and combinations can have an emotional impact on the listener, based on scientific, epistemological, and empirical studies. The observation of entropy in music, relevant to the active role music plays in social interaction, also supports our research, because it is the basic dynamic of the philosophy" of the mind.

Key words: Philosophy of cognitive science; theory of mind; music imagination; predictive processing; ethnomusicology; neuro musicology

Introduction

This study's ultimate goal is to provide a contemporary, in-depth and systematic analysis of several critical aspects of Al Farabi's music and science. Known as the Second Teacher – or Second Master – after Aristotle, Muhammad Ibn Muhammad Ibn Tarkhan Ibn Uzlagh, Abu Nasr Al Farabi (hereafter Al Farabi, 257–339H/870–950AD) is universally considered one of the great philosophers of the medieval period, but many aspects of his

work have remained unexplored, one of which is his involvement in the philosophy of music and in unifying the East and the West in philosophy. Also, monographs on Al Farabi and his philosophy are currently scarce. Besides Rodolphe d'Erlanger and Henry George Farmer, no other author has written a comprehensive review of his music and science."

This summary of the Greco-Arabic textual and historical background places Al Farabi at the intersection of different scientific and philosophical traditions, which can all be assumed to have influenced the Second Master's thought. Having authored treatises on all topics within philosophy, including music and psychology and especially neuroscientific research, Al Farabi was compelled by social conditions and a limited cultural perspective to synthesis Greco-Arabic philosophy and evaluate it as a whole by writing separate books on each subject with a reconciliatory nature. Nevertheless, the treatises that Averroes, Maimonides and others have published on Farabi's theories, especially his contribution to musicology and psychology, open the possibility to reconstruct these studies.

Farabi diligently critiqued the essential works of Aristotle's corpus, particularly focusing on the Organon. The authority of Arabic historiographical tradition mastered Aristotle's teaching and reached the highest peak of wisdom, as confirmed by the title of 'Second Teacher' or 'Second Master'. This validates the importance of Al Farabi's exegetical work and his status as an interpreter of Stagirit in the Arab-Islamic tradition. The disappearance of his comments on physics and Decaelo has proved to be a challenge in evaluating his works, as former commentators consider it important to discuss the views of previous or contemporary commentators on their account. The authoritative musical treatise, which occupies a unique position among Al Farabi's books, is Kitab al Musiqa al Kabir (The Great Book of Music), a renowned work from the medieval period. As a musician and theorist, Al Farabi wrote about the scientific aspects, observations and experiences of the art of music. The essence of this research also highlights the need for a deeper analytical inquiry of Al Farabi's music. This article, which attempts to close this gap, would not have been possible without the work of the abovementioned scholars. Despite its inevitable deficiencies, this study aspires to strengthen one's understanding of Al Farabi's philosophy and the ideas he left behind in the history of thought.

Methodology

As a starting point, this article aims to find hidden meanings that have remained unresolved in ninth – and tenth-century themes. Such legacy, which has been unexplored by sophisticated contemporary researchers but has continued to be valid in the current age, will be revealed through meaning, evidence, analysis and translations of studies. We attempt to strengthen the dialogue between

interdisciplinary perspectives and new methodologies across the philosophical spectrum. Capitalizing on the opportunity to question and rethink Al Farabi's traditional research methods, this research focuses on his methodology, that is, a multifaceted conceptualization of the scope and interrelation of the sciences. First, the fundamental question shaping this debate is both epistemological and methodological: What analytical tools and disciplines can people use to study musical influences and know the principles that govern them? Second, this study highlights the link between physics and metaphysics as a scientific method, its arrangements, techniques, the importance of observation, experience and the nature of the evidence associated with these sciences. In this sense, this study's direction is driven by Al Farabi's synthesis of works dating back to Aristotelianism and Neoplatonism.

Kitab al Musiqa al Kabir: a Profound Treatise on Music

The basis of Al Farabi's musical aspects is the comprehensive theoretical foundation of ancient music researchers as well as the advanced musical practice of the Middle Ages characterized by an extraordinary masterpiece, emotional mood and openness of unique feelings. Al Farabi was a celebrated philosopher and mathematician as well as a skilled musician. Known as the 'Second Teacher' (al-Mou'allim al-Tani) for studying and explaining the books of Aristotle (the 'First Teacher'), Al Farabi held a distinguished position among scientists, men of letters and philosophers. After a rich life, he died as an 80-year-old bachelor in Damascus. With his scientific contributions, Al Farabi was regarded as the greatest philosopher [1, p. 28].

All aspects of music research in the context of the sciences contained in Kitab al Musiqa al Kabir indicate the musical tradition of the common culture as its encyclopedic legacy of music. In his works, Al Farabi argues that nations and ethnic groups can unite through a musical culture and that the interaction of these civilizations succeeds through intercultural communication. The peculiarity of the Kitab al Musiqa al Kabir and the reason for the claim that a similar work has never been written may explain the method that Al Farabi points at the beginning of the book. This treatise moves within the framework of a system of philosophical knowledge to establish the foundations and parts of musicology in a hierarchical arrangement. The aspects of musicology that deal with multidisciplinary problems are precisely defined and organized in this work [2, p. 55]

Al Farabi expresses his views on the nature of musical art, incorporating in his interpretation the ambiguity of sound, which is the first element of music. This interpretation is also presented in his treatise entitled Classification of Sciences. On this basis, the Second Master conducted research that went to

the root essence of science and art as a physical substance, a geometric volume, and an arithmetic number as the second stage of knowledge [3, p. 189]. He wrote his treatise to prove that music is not only an art but also a science. Among his various treatises on the subject, the Kitab al Musiqi al Kabir (Great Book of Music) stands out. Here, he contained his melodies within a double octave, divided in accordance with the numerical ratios of the Greek tradition and that of Ptolemy in particular, where the notes were represented by letters of the alphabet. Rhythms, too, were given 'a classification inspired by Geometry and Arithmetic' [4, p. 221]. Al Farabi believed that sounds with arithmetical relationships and any movement produced by these sounds had a powerful and special effect on the human mind and argued that appropriate music had moral value. The power of musical philosophy and art lies in their ability to sense the universal in the particular, whether or not that the particular really exists. 'Art gives us the motions of the human soul in all their depth and variety. But the form, the measure and rhythm, of these motions is not comparable of any single state of emotion. What we feel in art is not a simple or single emotion quality. It is the dynamic process of life itself' [5, p. 32]. If the purpose of a musical composition is to be the carrier of an emotion, the value of the work is in proportion to its revealed effect.

'There exist two routes by which inanimate nature can come to symbolize human nature: either as a representation of emotions, or as a representation of ideas: Emotions, of course, are by their very nature impossible to represent directly; but they can be represented with respect to their form, and indeed there already exists a much beloved and effective type of art, which derives its thematic material from just such forms of emotion' [6, p. 85]. This art is called music; it is a representation of our emotional faculties and thus an imitation of human nature. The plausibility of the art-as expression thesis is particularly strong in arts based on imitation, where words and images express such features.

Plato was one of the first to study oral music. Even if the philosopher only uses the word music, he refers to songs, which consist of elements of poetry, musical mood and rhythm. He is sometimes understood to be proposing that the soul, like a scale, may contain several more parts than these three. However, he may instead be conceding that a musical scale – unlike the soul – does, as it happens, contain more than three elements. He noted that a just man tunes the three parts of his soul as a musician tunes a set of three notes of the scale 'and any others that as a matter of fact lie in between' [7, p. 189].

One fascinating feature of the educational accounts of philosophers and scientists is that it pays attention not only to the content of stories and songs, as we might expect, but also to their form or style. The main idea is that the musical mode and measure or rhythm of a song affects the human mind in-

dependently of the lyrics that are sung. The question whether music contains emotions or has an effect that can reveal emotions is still at the center of music philosophy in the current age. In summary, the search for an answer to the fascinating question of how music can encode emotions continues. The view that music encodes the emotion it contains rather than just triggering memories in the listener further supports the need to ask this question. Farabi first deals with this problem by classifying the melodies that trigger emotions. 'The frameworks of the more perfect melodies as 'strong', 'temperate' or 'soft' extending the polarity that also serves to classify tetrachord species as relatively 'strong' (i.e., diatonic) or relatively 'soft' (with less distance between their smallest intervals). Al Farabi names four emotional states evoked by strong frameworks – enmity, cruelty, anger and boldness – and four evoked by soft frameworks – fear, compassion, anxiety and cowardice – without arranging the emotions along a continuum from strongest to weakest' [8, p. 103].

To argue about knowledge, knowledge must exist, and the object must be perceived by the subject. In a sense, knowledge is the process of perceiving an explanation. In other words, it is a relation established between the knower and the known. In this relationship, the part on the knowing side is called the subject and the part on the known side is called the object. Knowledge is not limited to the subject's perception of the object. Moreover, human beings can acquire knowledge through thinking, remembering, dreaming and designing. 'The most sublime genus that encompasses all the species that expresses the nature of a sensible object is called a quality. This sublime genus, which includes all the species denoting the position of the sensible object, is called locality (i.e., site or place). The supreme genus that encompasses all the species that tell the time of the sensible object, whether it is in the past or in the future is called time. The supreme genus that encompasses all the species that declare the sensible object to be relative is called relativity. The highest genus that encompasses all the species that states that the sensible object is in a position or is placed in a position is called position. The most sublime kind that expresses the influence of the sensible object is called influence. The most sublime kind that expresses the affect of the sensible object is called influence' [9, p. 55].

The Second Master categorizes knowledge in two types. The first is sensory knowledge, which comprises the senses and is singular. This knowledge cannot be scientific knowledge because it is singular; however, it is a kind of knowledge that helps to achieve real knowledge. The other kind of knowledge is rational knowledge. By its means, human beings shape information and transform it into judgements through reason. Only in this way can real and precise information be obtained [10, p. 54]. Data and information are forms transmitted, received and recorded from outside the brain. Knowledge exists only in the brains of human [11, p. 1:175–88].

Al Farabi argues that theoretical foundations are either absolute first ideas or proven ideas in other arts. His perspective is toward the study of sound frequency vibrations, the origin and nature of sounds and their symptoms, which are considered in physics. 'I hold that when substance was given motion sound resulted. It [sound] was divided into three special kinds-high, low and medium. Therefore, there was need of an art through which we might proceed to the knowledge of high sounds, i.e. those that are in the extreme of acuteness, of low sounds, i.e. those that are in the extreme of gravity, and sounds that are midway between these, and the relationship of those to each other [i.e. their ratios], so that nothing may be concealed from us with regard to these things that belong to substance. That art, therefore, was the science of sounds' [12, p. 49]. In this framework, the aim is to study musicology in a multidimensional way, with the contribution of theoretical knowledge created by the data of the sciences that evaluate music in the research areas of the Kitab al Musiqa. Al Farabi defines the art of music as the science of sound and takes this goal to a broader dimension.

The effect of these movements is generated by the nature of the original movements that cause sound. Sound is a sensation produced by certain oscillating motions of a body's particles. It is transmitted to the ear usually through a medium such as atmospheric air, producing neural impressions. Thus, the subject naturally divides itself into three branches in relation to sound – production, transmission and perception. Over the last two decades in particular, the important role of emotion in cognition has been extensively discussed in the literature [13, p. 185-211]. Research on uncertainty, perception, cognition and emotion in the human mind remain in disjointed disciplines, despite their common theoretical foundations. Cognitive theories of emotion define uncertainty as a cognitive component that characterizes emotional states [14, p. 813-838]. Despite the advancement of research on the emotions in various scientific disciplines, there remains a lack of understanding or no clear definition of what emotions are. The lack of an interdisciplinary system of study between philosophy and other sciences, as was the case before the 20th century, is a major shortcoming in this regard. Psychologists and philosophers disagree on some fundamental questions such as whether emotions or thoughts come first [15, p. 379-399].

The two main approaches to human cognition and the conflict between them are a focus of the psychology literature. These approaches are defined as the cognitive tradition, which explains human cognition in terms of symbolic operations, and the other as the situated action or situational cognition approach, which focuses on the interaction of the environment, context, and sociocultural conditions in human cognition [16, p. 278-302].

Music philosophers have focused on psychology and cognitive science to explain traditional philosophical matters such as the emotional expressionism

of music. An individual perceptually acquires a mental understanding of form through felt tensions and decisions. As music is part of human nature, our musical experience is subject to the neurobiological constraints of the human mind. Many philosophers, through empirical observations, have sought to understand this, explored the field of preconscious and irrational responses, and applied the theory to cognitive science. The importance of perceptual, cognitive music theory is clear to understand musical patterns, particularly such metaphorical maps marked by changes in speed and intensity and voluntarily translated into force and motion.

Al Farabi approaches all problems through music's effects on the mind, allowing rhythm and harmony to penetrate one's inner soul. Offering a physiological metaphor, he argued that sound waves through which the music evolves into direct physical contact are vibrating frequencies that reach the air. Thus, the emotional and aesthetic effects of music clarify its physical properties and its direct origins. Therefore, Al Farabi's speculative psychology and experimental proof during the early period remain unique treatises on the philosophical discussions of music. At last, he resolved to disguise himself and ventured to undertake the journey which promised him a rich harvest. Dressed in a mean costume, he made his appearance at the court just at the time when the caliph was being entertained with his daily concert. Al Farabi, unknown to everyone, was permitted to exhibit his skill on the lute. Scarcely had he commenced his performance in a certain musical mode when he set all his audience laughing aloud, notwithstanding the efforts of the courtiers to suppress so unbecoming an exhibition of mirth in the royal presence.

In truth, even the caliph himself was compelled to burst out into a fit of laughter. Presently the performer changed to another mode, and the effect was that immediately all his hearers began to sigh, and soon tears of sadness replaced the previous tears of mirth. Again he played in another mode, which excited his audience to such a rage that they would have fought each other if he, seeing the danger, had not directly gone over to an appeasing mode. After this wonderful exhibition of his skill, Al Farabi concluded in a mode which had the effect of making his listeners fall into a profound sleep, during which he took his departure. It will be seen that this incident is almost identical with one recorded as having happened about twelve hundred years earlier. The distinguished flautist Timotheus successively aroused and subdued different passions by changing the musical modes during his performance, exactly in the same way as did Al Farabi [17, p. 55-56].

Al Farabi's experience in the caliph council showed that music is a subjective phenomenon of human experience and not merely a stimulus created over time to fit an acoustic structure or a well-controlled experimental design in the laboratory. Moreover, this experience is not based on a uniform mental capac-

ity but rather on a complex set of perceptive and cognitive operations in one's central nervous system.

Does music have a theme? This question is about revealing the semantic logic of musical art in Kitab al Musiqa al Kabir. The beginning of music sounds internal and starts with the sound of one's being. Al Farabi identifies two sound theories, that is, coming from natural and artificial sources. Each vibrating substance has an acoustic source, and sounds radiate by vibrating with the energy they receive from the source.

'Seasonal conditions characterize the sounds, pronunciation and flexibility of the mouth and throat cavities. The origin of the impulse to reveal sounds through word formation is the cause of the human desire to understand. The sense of hearing perceives different sounds of air coming from the chest, psalms in the throat, organs in the mouth and throat cavities as an expression of wish. Despite the purposelessness of the word itself, the power of desire motivates one to understand the ultimate goal in the word's content' [18, p. 22]. When one reflects on a physically identical world, they first discover a feature that is essentially the same only through physical exploration and guarantees consciousness. However, we also consider a world that cannot reach this stage – one with different fundamental elements. To address this problem, one would feel more motivated to continue thinking about a network of physics laws and other principles that connect the physical and the phenomenon.

Kitab al Musiqa al Kabir represents a fundamental perspective shift in the history of music, from a harmonic paradigm to melodic, cognitive and neuroscientific philosophy. In terms of the role of the cognitive sciences in supporting one or more of these explanations, a critical distinction is made between the causal basis of musical expression and the nature of experience that it promotes. A causal explanation provides a specific idea of the properties that allow for music to be used to express emotions and/or the psychological mechanisms for evaluating these properties.

Meanwhile, an empirical basis concerns the attempt to characterize, as accurately as possible, the association between the phenomenology of hearing music and emotions. One must examine the relation between musical experience and musical culture and identify the link between sounds and ourselves with a meaning that is neither subjective nor objective and created through collaboration and participation.

Conclusion

Al Farabi examined art from a disciplinary perspective of spirit and mind based on the existence of humans' 'creative ability' and its role in knowledge acquisition. He asserts that music and poetry have a sublimation in acquiring

creative talent. Music entails cultural particularizations of humans' capacity to construct multipurpose representations through the integration of knowledge across functional domains of human experience and behaviour, which are generally expressed in sound and temporally expanded or ordered. Al Farabi's performance in the caliph assembly and his arguments in it help us understand how to deal with this issue. Thus, this experience and evidence sufficiently convince us that music can assume many different emotional states, including preferences and moods. Through Kitab al Musiqa al Kabir, Al Farabi substantiated a highly responsible discipline within the psychology of music and the study of emotion in addition to relevant concepts. Moreover, the multidisciplinary unity that developed in different directions over time but closely examined by many medieval thinkers improves one's multifaceted evaluation.

Al Farabi devoted his extensive work on music to a repudiation of the claim that music is a pastime with the sole purpose of entertainment. Instead, he claims that the correct and measured utilization of music is a beneficial activity that fulfils scientific purposes in philosophical disciplines. By explaining how reactions are not between two living beings but rather between a living being and a piece of music, he focuses on the systematic development of a subject. His arguments strongly imply that overall, Kitab al Musiqa al Kabir goes further than merely discussing the principles of musical art and that providing a respectable place for music is an intensely scientific profession.

Finally, this review of Kitab al Musiqa al Kabir helps future researchers investigate the relation between the listener's responses to music and the emotions revealed by music. The analyzed data confirms that interrelated disciplines on systemic and functional methods can have a philosophical basis. This study offers a tenable suggestion to focus on Al Farabi's Classification of Sciences, which he established on a systemic structure as a unique key.

This study's results have theoretical and practical significance. The cognitive approach allows for more extensive research to examine artistic creativity from a philosophical perspective. Inferences and conclusions are consistent with interdisciplinary research. Principles of thinking determine the features of an author's perception of reality, that is, their picture of the world. Also, writers and composers who create artistic images develop their understanding and vision, which change depending on their mental impulses. External factors are said to significantly affect people's moods, thoughts, feelings and sensations.

Perception can be taken as purely psychological, denoting how cognitive systems display their sensitivity to environmental stimuli. The emerging situations play a specific role in guiding cognitive processes. While such a point may seem trivial, the possibility of such an analysis generally underscores the potential for a reductionist explanation. Without this analysis, no explanatory bridge can be built between lower-level physical facts and the phenomenon in

question. With this examination at our disposal, we must show how specific low-level physical mechanisms satisfy this analysis, revealing an explanation. In principle, explaining how these functions perform is quite manageable, but the details of such a physical description may be inadequate. Indeed, while specifics constitute a large part of any reductionist explanation, the analysis component is often lacking. However, once relevant details emerge, a story about low level physical causation will outline how relevant functions perform and thus explain the phenomenon in question. The answer must be that whenever empirical results produce conclusions about experience, the work is done by a principle that bridges physical processes to experience. This bridging focus will result in a criterion that applies at the physical level. Such a principle would serve as an epistemic influence for physical experience processes. Epistemic leverage is not empirically testable from a third-person perspective; instead, it acts as a previous background assumption, which is not always explicit. Hence, this work is the only way to gain intelligible knowledge through conscious experience.

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Нұрышева Г.Ж., Терджан Н.
Әл-Фараби философиясындағы музыка ақыл ғылымы ретінде

Аңдатпа. Мақалада музыкамен байланысты философиялық сұрақтарды когнитивистиканың, әсіресе психология мен неврологияның әдістерімен қалай негіздеуге болатыны зерттелген. Музыка арқылы жеткізудің көмегімен эмоцияны күшейтуге басты назар аудара отырып, бұл зерттеу философияның аясындағы пәнаралық саланы қарастырады. Сананың терең қабаттарымен байланысты мәселелердің алғашқы іздерін ежелі грек философиясынан байқауға болады. Адамзаттың бүкіл тарихы барысында философтардың басым көпшілігі Ғалам мен сананың іргелі мәселелері туралы пайымдап, жауап табуға тырысты. Музыка философиясының тұжырымдауынша, музыка өнері, алғашқы негіздердің әрқайсысы ақылдың қозғалысын қамтиды, ол қабылдау мен сезімдерді елестетуге сәйкес келетін фрагментациямен және синтезбен (композициямен) қорытындыланады. Әл-Фараби өзінің «Музыка туралы үлкен кітап» еңбегінде ғылыми, эпистемологиялық және эмпирикалық зерттеулерге сүйене отырып, музыкалық ритмнің, ырғақтың және біріктірудің белгілі бір ерекшеліктері тыңдаушыға қалай эмоциялық әсер ететінін бағалайды. Музыканың әлеуметтік өзара әсер етуінде белсенді рөл атқаратын музыкадағы энтропияны бақылау да біздің зерттеуімізде талданған, себебі ол – ақыл-ой философиясының негізгі динамикасы болып саналады.

Түйін сөздер: когнитивтік ғылым философиясыб ақыл-ой теориясы, музыкалық елестету, болжамдық өңдеу, этномузыкатану, нейромузыкатану.

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Музыка как наука разума в философии аль-Фараби

Аннотация. В данной статье рассматривается, как философские вопросы, связанные с музыкой, могут быть обоснованы подходами когнитивистики, особенно подходами психологии и неврологии. Сосредоточив внимание на активизации эмоций с помощью музыкального выражения, это исследование привлекает внимание к междисциплинарной области в рамках философии. Первые следы проблем, связанных с глубинами сознания, обнаруживаются в древнегреческой философии. На протяжении всей истории человечества большинство философов активно размышляли и пытались ответить на фундаментальные вопросы о Вселенной и сознании. Философия музыки утверждает, что искусство музыки, каждая из первых основ, включает в себя характерное движение ума, которое суммируется фрагментацией и синтезом (композицией) в соответствии с восприятием и воображением чувств. Аль-Фараби в своем труде «Большая книга музыки», основываясь на научных, эпистемологических и эмпирических исследованиях, оценивает, как определенные особенности музыкального ритма, тональности и сочетаний могут оказывать эмоциональное воздействие на слушателя. Наблюдение энтропии в музыке, относящееся к активной роли, которую музыка играет в социальном взаимодействии, также поддерживает наше исследование, поскольку это основная динамика философии «разума».

Ключевые слова: Философия когнитивной науки; теория разума; музыкальное воображение; прогностическая обработка; этномузыковедение; нейромузыковедение.