The Origin and Power of Music According to the 11th-Century Islamic Philosopher Ibn Sīnā

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Abstract

The question of the origin of music and its powers has always fascinated philosophers and scientists. Here we present a close reading of the view offered by the Persian Muslim philosopher and scientist Ibn Sīnā, also known as Avicenna (980–1037). We draw a parallel between Ibn Sīnā's account of the senses and mental capacities and his hierarchical, quasi-evolutionary view of the perception of sound in its various communicative roles. We show how Ibn Sīnā positions music at the top of the organisation of sound while drawing a connecting line between the sensory and cognitive, the natural and conventional, and the biological and aesthetic. Although mostly drawing on ideas previously expounded by Aristotle and al-Fārābī, he goes way beyond his predecessors in positioning music within the systems of communication and highlights music's special ability to create a flux of joy and sadness, tension and relaxation, based on the ephemeral character of sound that serves as a connecting thread through all levels of its communicative roles.

Introduction

The question of the origin of music has always fascinated philosophers and scientists. The very different approaches to this question throughout history attest not only to general changes in epistemology but also to the specific position of music within the changing world of knowledge. Within this framework, it is especially revealing to read the view of Ibn Sīnā (980-1037)—Avicenna in Latinate form—the eminent Persian Muslim philosopher and scientist who lived in the Islamic Golden Age (9th-12th centuries). His view is not only interesting because it represents an exemplar of the writings of one of the most important philosophers of this age and culture, but also because it is extremely original, diverging in many respects from other views of his time on the origin of music. As we demonstrate in this article, Ibn Sīnā establishes a logical and *continuous* thread that connects sound, communication, emotions and aesthetics, and through this holistic approach offers a view that extends beyond that of his Greek and Arab predecessors.

This view, which one could describe as quasi-evolutionary, is very different from the approach that asks "who was the first" to discover or receive music from some external

JRAS, Series 3, 29, 4 (2019), pp. 585–598
doi:10.1017/S1356186319000178

agent, which is very much the one seen in the genre of *awā'il* (pl. form) found in medieval Arabic literature.[1] This genre was particularly concerned with recording the first occurrences of things with reference to inventors or initiators of certain behaviours or knowledge and reflected the growing interest of Muslims in the history of civilisation and science. In this literature, beginning in the 9th century, we find many references to the origin of music and musical instruments, often based on biblical or Jewish sources, including many legendary materials.[2,3]

In the Bible, the main figures related to the invention of music and musical instruments appear in Chapter 4 in the book of Genesis. In this chapter, after Cain murders Abel, we are told that he was exiled and we are then given the genealogy of Cain down to Lamech and his three sons and daughter: Jabal "was the father of those who dwell in tents and have cattle; His brother's name was *Jubal; he was the father of those who play the kinnor and 'ugav* (lyre and pipe)".[4,5] Importantly, as Shiloah notes,[6] Jubal appears in most exegeses not only as the inventor of specific instruments but also as the inventor of music itself. The next verse tells us that "Zillah [one of Lamech's two wives], she also bore Tubal-Cain, the instructor of every worker in bronze and iron. The sister of Tubal-Cain was Naamah".[7] Although we are told nothing more of Naamah besides her name (roughly translated as 'the lovely'), both Jewish and early Christian sources depict her as the leader of the female players and singers who sang songs and laments.[8] In the verses that follow immediately after this, we are presented with Lamech's poetic song to his wives, which possibly hovers between song and speech: "Lamech said to his wives: Adah and Zillah, hear my voice, you wives of Lamech, give ear to my speech".[9]

In contrast with the Jewish source, some Arabic sources from the 9th and 10th centuries, such as Ibn Khurradadhbih (d. 911), Hishām al Kalbī (d. 819) and al-Mufaḍḍal ibn Salāma

[1]A. Shiloah, *The Epistle on Music of the Ikhwan Al-Safa (Bagdad, 10th century)*, (Tel Aviv, 1976), pp. 3–4.

[2]In fact, this tendency can even be seen much later, for example in the 18th century writer al Muslim al Mawsili, "Introduction", *The Pure Pearl Concerning the Art of Music*, in which he suggests an etymology for the word *mūsīqī*. He suggests a derivation from *Mūsa* (Moses in Arabic) and *isqī* which means 'to engulf in water'. Referring to Chapter 17 in the book of Exodus, which tells us how Moses hit a rock and it sprinkled water, al Mawsili tells us how this water created 12 springs, each of which produced a different sounding melody, which in turn became the source of the 12 musical 'scales' or *maqamat*. See A. Shiloah, *Music and its Virtues in Islamic and Judaic Writings*. Variorum Collected Studies (Aldershot, 2007), pp. 80–81.

[3]Different cultures share the notion that music was given to us by a primordial, often legendary agent. The philosopher Heraclides tells us that Amphion, who received his artistry from his divine father Zeus, was the inventor of music. The Egyptians ascribed the gift to their god Thot, while for the Chinese their musical system was the gift of the magic bird Fung-Hoang. Similarly, the earliest songs of the Hindus, the sacred Ragas, were magical songs sung by the gods: see Siegfried Nadel and Theodore Baker Source, "The Origins of Music", *The Musical Quarterly*, 16, 4 (1930), pp. 531–546.

[4]Although the direct translation of *'ugav* in modern Hebrew is 'organ', clearly this is not the meaning of this word here; rather it refers to some kind of wind instrument, possibly a double reed: Joachim Braun, *Music in Ancient Israel/Palestine: Archeological, Written, and Comparative Sources* (Michigan, 2002).

[5]Genesis, 4:20 and 4:21.

[6]Shiloah, *Music and its Virtues*, Part I/I, p. 5.

[7]Genesis, 4:22.

[8]In Targum Pseudo-Jonathan she is referred to as "the mistress of dirges [*qinin* pl. of *qina*] and songs": see Cassuto, A Commentary on the Book of Genesis. (Jerusalem, 1961), p. 238. Both Henry George Farmer, *A History of Arabian Music: to the XIIIth Century* (London, 1929), pp. 6–7, and Shiloah, *Music and its Virtues*, Part I/I, p. 6, mention that in the Arab version of his *Compendium of the History of Dynasties*, Ibn al-Ibri (known as Bar Hebraeus the Syrian, the patriarch of the Eastern Jacobite church, d. 1289) includes Cain's descendent daughters in the list of inventors of musical instruments.

[9]Genesis, 4:23.

(d.905), attribute the invention of music—the first lament—and the first musical instrument —the *'ud*—not to Jubal but rather to his father Lamak (Lamech).[10] The story is that Lamak had no children until old age when he finally fathered two daughters and then, to his great joy, a son. However, the son died when he was just five years old. Lamak grieved sorely for him and decided to hang his body up on a tree so his image would be constantly in front of his eyes until it fell to pieces, or until Lamak himself died. When only the thigh bone remained, along with the leg, foot and toes, Lamak built a wooden chest to represent the thigh, a neck to represent the leg, and a peg box and pegs to represent the foot and toe, and strung them with strings (like the sinews). Then he began to play this instrument, weeping and lamenting, until he became blind. In these sources Zillah, referred to as his daughter, though probably pointing to Naamah, was the first to make stringed instruments and drums. It is noteworthy that in this tradition, music and its main instruments originated from the accursed children of Cain, possibly reflecting the dangers associated in Islam with music.[11]

Many other medieval Arab sources, specifically dealing with the philosophy of music, attribute the invention of music to the philosophers, including, of course, Pythagoras, the father of the science of music (the only one able to hear the "music of the spheres"), and by extension, music itself. Most notably, one can cite al-Kindī, often referred to as the "father" of Arab philosophy (d. 870) and the Ikhwān al Safa or Bretheren of Purity[12] In their *Epistle on Music*, the Ikhwān, for example, write that "… It follows that the musical art was invented by the Greek philosophers thanks to their science; then people learned it from them and used it like other arts in their actions and occupations in terms of the various aims that they set themselves".[13] Both al-Kindī and the Ikhwān adopted a strongly Pythagorean-Platonic approach whereby music was discussed in terms of the same numerical relationships that govern the whole universe, ranging from the celestial bodies and natural elements, through to our physiology (body humours), emotions and character traits. This approach fully resonates with that found in the West from the Greeks through to the *cinquecento*.[14]

Ibn Sīnā, and his predecessor al-Fārābī (d. 850), the renowned Turco-Persian Muslim philosopher and scientist—Alpharabius in Latinate form[15]—represent a different, Aristotelian approach, which rejects the numerical view in favour of the principles governing the subject itself and its perception. Like Aristoxenus they both suggest that music is a by-product of

[10]Shiloah, *Music and its Virtues*, Part I/I, pp. 8–9.

[11]Farmer, *A History of Arabian Music*, pp. 6–7, relies on the *Huth* manuscript which suggests that Tubal, the son of Jubal, was the inventor of the drum (*ṭabl*) and the tambourine (*duff*), while his daughter Dilal invented the instruments with open strings such as the harp and psaltery. The invention of the pandora (*tunbur*) is attributed to the people of Sodom, while most of the wind instruments were attributed to the Persians.

[12]Although there are many others, such as al Jāḥiḍh (d. 869), Ibn Khurradadhbih (d. 911) and Ibn Baǧǧah (d. 1139). Cited in Fadlou Shehadi, *Philosophies of Music in Medieval Islam* (Leiden, 1995).

[13]Shiloah, *The Epistle*, p. 15.

[14]Carla Bromberg, 'A Preliminary Study of the Origin of Music in Cinquecento Musical Treatises', *International Review of the Aesthetics and Sociology of Music*, 41, 2 (2010), pp. 161–183.

[15]Due to the lack of biographical data about al-Fārābī, there is disagreement over his ethnic background. Some scholars state that al-Fārābī was of Iranian origin, while others assign him a Turkic origin. Those scholars base their arguments on, inter alia, the appearance of references and glosses in Persian and Sogdian in al-Fārābī's works, his toponymical surname and his pedigree. For a detailed discussion of this subject, see Dimitri Gutas, 'Fārābī', in *Encyclopædia Iranica* (New York, 1996).

instinctive dispositions and draw some interesting parallels between music and language.[16] But whereas al-Fārābī limits himself to juxtaposing the two points along the continuum from sound to music—an "initial instinctive use of the voice to express emotion", on the one hand, and the perfection of sound as music on the other[17]—Ibn Sīnā describes the *full path* in-between these two end points. In so doing, he draws heavily on the role of sound as a communicative medium among both animals and humans, and in this sense he is suggesting a much more developed evolutionary perspective.[18]

As detailed below, most ideas in Ibn Sīnā's introduction are not, in and of themselves, original and they appear, albeit in a scattered manner, in previous sources. Rather, it is their flow and threading into a coherent narrative, placing music within other systems of communication that is so innovative. In a somewhat similar vein, in his introduction to the translation of the "Epistle on Music by the Ikhwan al-Safa", Shiloah writes, "Certainly most of the subjects and ideas in the Epistle are neither new nor exclusive to it … However, the method of interweaving these ideas and subjects, taken from various sources, and organising them from an ideological and literary point of view, confers on them in this work of the Ikhwān a particularity difficult to parallel".[19]

Ibn Sīnā presents his view in the "*Muqaddima*" (introduction) to the chapter "*Jawāmi' 'Ilm al-Mūsīqī*" (A Compendium of the Science of Music).[20] This is the twelfth chapter of the third volume, *al-Riyāḍiyyāt* (Mathematics), of Ibn Sīnā's philosophical and scientific encyclopedia, *Kitāb al-Shifā'* (Book of Healing). (A similar chapter appears in his condensed version of *al-Shifā'—Kitāb al-Najāt*.[21]) Here we do not offer a philological study of the source, rather we refer to this version, which is based on the manuscripts known as *Dār al Kutub* 894 (Cairo) and *DāMādibrāhim* Suleymaniye 822 (Istanbul). We rely on sections translated by Shehadi,[22] the annotated French translation of the whole treatise, including the introduction by d'Erlanger,[23] and our own reading of the Arabic text.

Ibn Sīnā's *Muqaddima* presents some difficulties. These are associated with interpreting its ideas, which tend to appear in a germinal fashion. Moreover, there are problems with translation and terminology, especially of the word "*mūsīqī*": it does not appear in the introduction and is reserved for the chapters that follow, which deal with music and its elements: loudness, intervals, consonance and dissonance, genres (types of tetrachords) and their groupings, melody formation, embellishments, rhythm and rhythmic patterns, poetic meters

[16]Farmer, *A History of Arabian Music*; Shehadi, *Philosophies of Music*, p. 59.

[17]Wright suggests al-Fārābī too offers an "evolutionary" view of music. He writes that the extensive introduction to al-Fārābi's *Kitāb al-mūsīqī al-kabīr* "is of particular interest for its methodology. It proposes an evolutionary view of music, developing from an initial instinctive use of the voice to express emotion towards a present state of perfection": Owen Wright, "Arab Music", *Grove Music Online* (2007), (ed.) Deane Root <http://www.oxford-musiconline.com, [accessed 30 October 2017). [4]

[18]As is evident when one compares the two introductions, al-Fārābī only sketches the end points whereas Ibn Sīnā offers a much fuller account of the biological roots of vocal communication.

[19]Shiloah, *The Epistle*, p. 5.

[20]abū-'Alī Ibn Sīnā, "*Jawāmi' 'Ilm al-Mūsīqī*" (A Compendium of the Science of Music), in *Kitāb al-Shifā'* (Book of Healing), Vol. 3: *al-Riyāḍiyyāt* (Mathematics), (eds) Aḥmad Fu'ād al-'Ihwānī and Maḥmūd Aḥmad al-Ḥifnī (Cairo, 1956).

[21]For details about the manuscripts and printed sources of these two works, see Mahfouz El-Tawil, *Music of Avicenna* (Devon, 2015).

[22]Shehadi, *Philosophies of Music*.

[23]R. D'Erlanger, 'Avicenne: Un Traité sur la Musique', in *La Musique Arabe*, Vol. 2: *al-Fārābi et Avicenne* (Paris, 1935) pp. 258–260. This translation is based on MS n 118, India Office, London.

and musical instruments.[24] In the introduction Ibn Sīnā frequently uses the word "sound" (*ṣawt*), as used for communication among individual animals and humans. This fact compels us to raise the question: does the description of the function and natural position of sound, as described by Ibn Sīnā, relate directly to his view on the origin of music? Or does he see music as a separate phenomenon? The mere fact that the two topics not only follow one another, but also appear together under the heading "A Compendium of the Science of Music", suggests that Ibn Sīnā sees the communicative function of sound as a precursor for music. This will become much clearer as we follow Ibn Sīnā's logic and threading of ideas, taking into consideration his description of perception and cognition as a framework for his thinking about these issues.

In this, we significantly extend and elaborate on Shehadi, the only author known to us who presents a full account of Ibn Sīnā's introduction and who cites some selected passages from it in his book *Philosophies of Music in Medieval Islam*.[25] Shehadi struggles to relate the aesthetic analysis of music to the functionalist analysis of sound. He formulates his solution to this relationship as follows: "the aesthetic analysis pinpoints what we as a matter of fact enjoy in music. The functionalist account of the more general phenomenon of sound, however, supplies a kind of explanation of why we enjoy what we do in music".[26] According to Ibn Sīnā, Shehadi suggests, our desire for sound has been instilled in us through our life experiences and is always present, even when we listen to sound as an aesthetic object. The ability of sound to stir our emotions is enhanced when it is organised in proper proportions, the perception of which relies on our discerning faculty that is drawn to the subtler elements of order in music. Shehadi notes that even when Ibn Sīnā describes the aesthetic aspect of order in music, he indirectly connects it with his functionalist account. He describes Ibn Sīnā's text as offering a "dramatized similarity between our reaction to the sequencing of melodies in the composition and the alternation in real life between the pleasures at meeting what or who we love, and the sorrow of parting therefrom".[27] Nonetheless, Shehadi omits many important passages from the introduction and pays little attention to the originality of Ibn Sīnā's view and its resonance with much later theories on the origin of music.

As a way of introducing our reading of the *Muqaddima,* we first present a summary of Ibn Sīnā's view on the perceptive and cognitive abilities of animals and humans as it appears in his *Kitāb al-Shifā'* (Book of Healing) in the part dedicated to "psychology" (*al-nafs*). Although, many of his ideas follow Aristotle's "De Anima",[28] Ibn Sīnā does extend and elaborate on these through additional subdivisions of the various faculties. In addition to the relevance of these notes to understanding the observant and mental faculties required for the perception of sound in its various forms, they also give the reader a sense of Ibn Sīnā's general approach. This highlights his hierarchical view of our mental abilities, which is that higher level and abstract mental processes always rely and interact with lower-level perceptual ones. This view is not only consistent with much of what we know today

[24] *Ibid.*
[25] Shehadi, *Philosophies of Music*, pp. 66–80.
[26] *Ibid.*, p. 78.
[27] *Ibid.*, p. 80.
[28] Aristotle, *On the Soul*, (translated) J. A. Smith (Adelaide, 2006).

about hierarchies in the brain (in principle and not in detail, of course), but also suggests that a similar view could be applied, as demonstrated below, to the relationship between the biological and communicative functions of sound, and our response to music. In the next section, we will present our interpretation of Ibn Sīnā's exposition of his thoughts on the origin and influence of music, and point to the way in which these relate in indirect ways to much later views.

According to Ibn Sīnā, perception is one of the most important characteristics of animals and, to some degree, humans too.[29] In his view, perception includes a material object transmitting a sensible form to the relevant sense organ. This sensible form impresses itself on the correlative sense organ, thereby creating an act of sensation. Correspondingly, he describes the faculty of hearing as a power arrayed in the nerve dispersed on the surface of the ear canal, which is disposed to perceive air oscillations. Specifically, according to Ibn Sīnā, hearing comprises the ability of the eardrum to vibrate at the same frequency as the oscillating air, thus impressing the external object into the hearing sense organ. Hearing, of course, is only one of five *external senses* (others being sight, smell, touch and taste) whose various impressions are fed into the internal sense or *fantasia*, the so-called 'common' sense (similar to the common sense described by Aristotle) to create a unified, sensible experience. The *form* of this unified perception is stored in the *retentive imagination* or *form-bearing* faculty. In contrast, *connotational attributes* are perceived only by the *internal sense*. Connotational attributes do not rely on any sensible feature but rather process the attributes that belong to, and are conveyed by, the object, such as the feeling of threat or passage of time. While the first level of perception requires the presence of the perceived material object, imagining the object can be realised even in the absence of the material, but the produced image must have features related to material attributes such as shape, colour and position. The *estimative faculty*, which drives the creation of connotational attributes, is even more abstract since it includes qualities such as approach-withdrawal or the hedonic value of objects. The information from the estimative faculty is conveyed to the *appetitive faculty* which incites and guides action and movement. Today we call this motivational learning and reward, although we now know that these are basic "low level" systems, rather than high level ones as understood by Ibn Sīnā. The faculty of memory retains connotational attributes, especially objects perceived by the estimative faculty. The highest faculty of animal souls is that of the *compositive imagination*; in humans this is controlled by the intellect and becomes the *cogitative faculty*. This faculty separates and recombines different parts of sensible objects "not according to the form that we found in them externally nor even affirming if some of them exist or do not".[30] While the compositive imagination can lead to the conjuring up of new or unrealistic images, it is not limited to this function; rather, it enables the animal to imagine itself obtaining some biological reward in the future, such as food or mating.

Finally, in humans, there are two types of intellect. The most abstract of all the faculties is the *practical intellect*, which deals with what is right or wrong, good or evil, and other moral questions. The second is the *theoretical intellect* which allows us to perceive the essence of

[29]Jon McGinnis, *Avicenna* (New York, 2010).

[30]Avicenna Shifā', 'at-Tabī'īyāt, Kitāb an-Nafs (Psychology)', in *Avicenna's* De Anima (Arabic Text): *Being the Psychological Part of Kitāb al-Shifā*, (ed.) Fazlul Rahman (London, 1959), Vol. IV.1, pp. 165.19–166.

things, stripped away from any particularity driven by material concomitants, such as quantitative qualitative, spatial or temporal determinants.

McGinnis summarises:

> Despite the great diversity of powers, associated with living things, Avicenna sees them all as closely interrelated, indeed even forming a hierarchy. It would be best, he [Avicenna] says, if one thinks of each of the lower souls as being a condition for what follows. In effect, suggests Avicenna, one might take the vegetative soul as a genus for animal souls, and animal soul as a genus for the human soul.[31] Moreover, there is for Avicenna a relation of ruler and ruled found among them. Thus the theoretical intellect rules the practical intellect, which in turn rules the internal senses. The internal senses are served by the external senses which provide the former with their contact and raw data about the world. These perceptive powers themselves are served by the motive or moving powers, where the inciting powers rules over the powers that produce motion.[32]

Based on this general hierarchical approach, we propose a reading of the introduction to the philosophy of music in which higher levels relate back to, and are dependent on, lower ones: the cognitive relies on the sensory; the conventional on the natural; the functions of sound in the human world on its functions in the animal world; and the aesthetic on the functional, with each level adding new requirements and constraints. As already mentioned, many of the ideas in the introduction are not in and of themselves original. They appear in various forms in the writings of the Greek (especially Aristotle)[33] and Arab (especially al-Fārābī) philosophers, including in discussions on the nature of sound and the distinction between articulate (speech) and inarticulate sounds; the use of voice to express joy and pain in animals; language as a unique human device for expressing moral sentiments (in Aristotle) and inner feelings (in Ibn Sīnā); mimesis and the pleasure to be found in good proportions and order.

Among these we point to the consistent references to the effect of music on animals in the Arab writings. Thus for example, al-Kindī talks about the appeal for certain animals (and peoples) of the sounds of particular instruments such as the attraction of dolphins and whales to the sound of the flute (*al-zamr*) and horn (*al būq*).[34] The Ikhwān al Safā assert that all animals with a sense of hearing take pleasure in music. Among their examples they include the *ḥudā'* (one of the first forms of Arabic songs) sung by the camel drivers to encourage the camels in their march and help them forget their heavy loads.[35,36,37]

Notwithstanding the above, in none of the above-mentioned sources do we see *how* these and other ideas are brought together and interwoven into a flow of logic in order to introduce the art of music and explain the power of sound from the biological up to the aesthetic, framing music as an extension of other communicative systems. Ibn Sīnā's

[31] *Ibid*., Vol. I.5, pp. 40.4–13.
[32] McGinnis, *Avicenna*, p. 95.
[33] D'Erlanger, 'Avicenne: Un Traité sur la Musique', pp. 258–260.
[34] Shehadi, *Philosophies of Music*, p. 27.
[35] Abū-Naṣr al-Fārābī, *al-Kitāb al-Musīqī al-Kabīr* (The Great Book of Music), (ed.) Ghaṭṭas 'abd-al-Malik Khashabah and Maḥmūd Aḥmad al-Ḥifnī (Cairo, 1967).
[36] Shiloah, *The Epistle*, p. 17; see also *ibid*., pp. 70–71.
[37] al-Fārābī too gives the example of al *ḥudā'* which is one of the enchantments believed to be the instincts and dispositions which created the melodies. See al-Fārābī, *al-Kitāb al-Musīqī*, pp. 70–71.

https://doi.org/10.1017/S1356186319000178 Published online by Cambridge University Press

introduction culminates in an extremely original psychological description which, to our minds, captures the agency associated with music, processes of expectation and the flux between tension and relaxation as described below.

We first present an outline of this logic, followed by a close reading of the treatise itself. Given the complexities of the text, we offer, either in the footnotes or in the body of this article, selected passages from our translation. Where the literal translation of the text is too obscure, or where there are some (relatively minor) divergences between our reading and d'Erlanger's translation, we also give his French translation.[38] The topics in the introduction (following some general comments described below) are as follows:

1. Sound as a sensory object.
2. The role of sound in the animal kingdom.
3. Which characteristics of sound enable it to fulfil its functions.
4. The emotional impact of sound or voice on animals and humans.
5. The role of voice in human communication vis-à-vis natural tone inflections and articulated speech (the conventional inflections of the voice).
6. Ordered and embellished sounds (poetry and music) which extend beyond our natural desire for sound, and its communicative role via three mechanisms. The first is commonly found in poetry and music, while the second and third are unique to music:
   a) Extension from the sensory to our discerning faculty which is sensitive to order and structure[6]
   b) Melodies can imitate and instil good qualities (mimesis).
   c) The ongoing oscillation of the presence and disappearance of sound (in melodies) results in a flux of positive and negative emotions.

At the outset of his introduction (see our translation in footnote 39), Ibn Sīnā, like his predecessor al-Fārābī, rejects the Platonic-Pythagorean approach in which music is one manifestation of the same numerical proportions that govern the universe and motion of the celestial bodies, on the one hand, and the human soul, on the other. He deems this relationship to be external to the phenomenon of music, which he frames, like al-Fārābī, as a perceptual phenomenon.[39] He scolds those who blindly accept the philosophies of the

[38]See footnote 23.

[39]"It is time for us to conclude the mathematical branch of philosophy and set forth a compendium of the science of music, limiting ourselves to what is essential to it and part of its conception, and what follows from its principles and elements; we do not extend our discussion with numerical and arithmetical principles and corollaries, for these one may seek from the science of arithmetic, by clearly stating what is brought, or by clarifying what is within it, we also ignore the similarities between the celestial bodies and human character traits [on the one hand] and the ratios of musical intervals [on the other]. This is the way of those, for whom the sciences have not been distinguished the one from the other, and it has not become clear to them what is essential and what is accidental, and these are people, whose philosophy is ancient, which has been inherited in its unrefined form and emulated by those negligent ones who have otherwise understood the instructive philosophy and the truth-seeking analysis. This distractedness brought on by emulation, a heedlessness shielded by the high esteem for the ancients, has led to the [uncritical] acceptance. This habit deflects one from the truth; it is a pliant attitude that blocks careful thought. And indeed, we have done everything possible to discern the truth itself, and resist, as far as possible, the pull of tradition, realising, however, that care tends to protect one most of the time, but not always, and caution protects from error but not in everything. And we are in need of our partners for rectifying what we have neglected, and what we have failed to see, and Allah is the one who succeeds our path of hoping for feasible rectitude and a mistake avoided by his [Allah] mercifulness".

ancients without reconsidering them critically, possibly hinting at the school of al-Kindī (801–873) and his followers. Moreover, Ibn Sīnā himself acknowledges the uniqueness of his introduction by stating that it differs from his other introductions to scientific topics.[40] Rather, he asserts, he is basing his introduction on empirical observations, intuition[41] and scientific and philosophical methods.

The first paragraph following these general observations deals with sound as a sensory phenomenon:

> Sound (*ṣawt*), among tangible modalities, is special in sweetness (*ḥalāwa*), qua sound, a kind which pleases the sense and another detested by it, not by means of offensive excessiveness (*Ifrāṭ*), since this is shared by tangible modalities (*kayfiyya*), since smell—for example—could be detested by virtue of its kind, as is detested one of the kinds of the odors of decomposed organic matter, even if it is mixed or concealed, and could be detested by virtue of its force and sharpness, and its excessiveness in moving the sense, even if it matches its kind and resembles its nature, such as the strong smell found in the musk and the pure light in the eye of the sun, since they both may exhaust the sense, even if it is calmed by them. There is no genus of sound which pleases or offends the sense qua sound, even if there is in its genus what is offensive by means of excessiveness, then its offensive effect on the instrument (*āla*) [sense organ] would be owing to the fact that it is related to a thumping, violent, or separative (*mufarriqa*) movement, as I so presume, not the fact that it is a thing to be heard, and if it is hated because of its being heard, then it is because of the excessiveness.
>
> But sound pleases or offends the soul (*nafs*) from another side, and this is either by imitation (*ḥikāya*) or composition, and what it offers by these two things is unique to the discerning faculty in the animal soul, not to the sense qua sense of hearing. And you knew by what we have preceded the state [nature] of this faculty in humans and animals. And it benefits us to expand the discussion of this matter as much as possible, so we say: …

This paragraph contains prima facie self-contradictions as to whether sound can be pleasant or unpleasant, even though Ibn Sīnā begins by stating that "sound among tangible modalities (the senses) is special in sweetness". On the sensory level, he says, sound (like all other senses) can be unpleasant if it is excessive. A very loud sound can be offensive to the sense of hearing, just like the usually loved radiance of the sun can be harmful if it is too strong. Both can fatigue the relevant sense. But unlike smell, which can be inherently agreeable (e.g. the musk perfume) or disagreeable (e.g. the stink of decomposing organic material), the pleasantness of sound is not inherent. Ibn Sīnā says that beyond excessiveness, sound's unpleasantness is not driven by any specific auditory characteristic, but rather by its association with a violent movement—presumably related to the motion of the hearing organ while "impressing the external object on the hearing sense organ".[42]

[40]"Indeed, before delving into the pure part of this craft (*ṣinā'a*) we are preceding an introduction which does not follow the principles of arithmetic, and is not very similar to our other introductions concerning the principles of sciences, but is composed of laws, which came to mind by experiences, and rules founded on right intuition (*ḥadas*), combined with philosophical judgments and scientific doctrine …".

[41]Intuition (*ḥadas*) in Ibn Sīnā is the highest possible human capacity for knowledge which is obtained when the soul conjugates with the external and eternal "active intellect/agent". Steven Harvey (ed.), *Anthology of the Writings of Avicenna* (Tel Aviv, 2009), p. 117; McGinnis, *Avicenna*, pp. 147–148.

[42]This is a somewhat divergent translation of D'Erlanger: "Je dis donc que le son est une des manifestations extérieures que nos sens perçoivent (un sensible) et dont la sensation peut nous être agréable. J'entends parler ici

The interest in sound for Ibn Sīnā,, however, does not lie on the sensory level, but rather on the perceptual and cognitive one (the discerning faculty) and on the effects that sound has on the soul, obtained through "imitation" or "composition"—two concepts he returns to at the end of his introduction. He clearly states that from this point on the discussion is an expansion and explication of this higher aspect of sound which, as described below, elaborates on why and how music has such a strong influence on the human soul.

Following this discussion, Ibn Sīnā presents his view on sound as the basis for language and music. We can see in the flow of his themes a hierarchy that presents an increasing complexity of the functions of sound. First Ibn Sīnā talks about how sound is used in the animal kingdom (the most basic level), which serves three main functions:

1. Finding a conspecific following separation to ensure mating and maintenance of the species as separation is inevitable when animals roam to satisfy their various needs.
2. Call for assistance (distress calls), more typical in the young.
3. Repulsion of enemies (territorial calls).

These three functions, he asserts, require that the medium used for communication fulfils three conditions which can only be met by the medium of sound:

1. It can travel distances.
2. It spreads in all directions.
3. It is not blocked by obstacles.

> Indeed, nature, which is a divine impression (*athar*) in bodies, preserves them [the bodies] according to the system and leading them into order, because of the knowledge of the One [God] who manages their concerns, so that animal species are preserved by reproduction, and reproduction by mating, and mating derives its benefit by proximity, and it is impossible for a couple of animals to be in permanent proximity, as different needs may separate them which spawn motion in [disparate directions], and then the aforementioned purpose [mating] raises the need of proximity after distance, and to meet after the separation—[nature] has provided the animal with an instrument (*āla*) whereby he could call the other for meeting in case of parting, and to locate his consort by signs if distanced from it. Then it [nature] created a sign for the animal in other circumstances, which call for meeting for assistance, or repelling [enemies] away from his conspecifics, until the chick or pup or the young animal if he uses this instrument, then he summons back his absent assistants when he calls for help, or he repels the danger [the offender] by his

de la qualité du son qui le rend agréable ou désagréable à l'oreille, et non du mauvais effet résultant d'un excès qui peut être anormal. Il est, en effet, du son comme de tous les autres sensibles. Ainsi, une odeur peut répugner par sa nature, comme celle de différentes choses puantes, même si elle est faible et cachée, ou par son excès seul; S'il s'agit d'une odeur agréable, comme celle du musc par exemple, et qu'elle soit trop puissante, elle nous sera désagréable, tout comme nous sera pénible la sensation des rayons solaires lorsqu'ils sont trop intenses. Toutes deux fatiguent les sens, quoiqu'elles soient en principe bienfaisanres."

Le son en tant que sensation ne saurait donc nous être agréable ou désagréable en lui-mem; seulement notre Oreille en souffre quand il est trop violent. Un instrument de musique, pincé ou frappé trop fortement, produit un son désagréable que nous repoussons instinctivement. Mais, d'une autre manière, le son peut nous être agréable ou désagréable, non plus en tant que la sensation, mais relativement à notre faculté de d'entendement, qui juge l'idée de rappelle à qu'il joue dans une composition. Nous avons expliqué clairement par ailleurs la fonction de cette faculté de d'entendement que possédent l'homme et l'animal; aussi nous n'en dirons rien ici": D'Erlanger, 'Avicenne: Un Traité sur la Musique', pp. 106–107.

https://doi.org/10.1017/S1356186319000178 Published online by Cambridge University Press

> alarm call to his conspecifics, and these are circumstances that the truth of what I say thereof is manifested by experiences, and moreover, they convince you they are true and real, demand you to substantiate them and believe them to be one of the existents (*mawjūdāt*)[43] if you contemplate the state of God's supervision of the creatures, and that they are not left without the necessities crucial and beneficial for their existence. And this instrument could not have been a body (*jism*) which communicates between the close and the distant, the present and the absent, nor one of the tangible accidents which requires a direction for its perception, and whose penetration reaches a limit, and is impeded from the close, all the more so the distant, as by a screen (*sutra*) [obstacle] rather, it must be like sound. And then, could you deny its nature that it reaches until the end of goals [distances], and surrounds all directions, and is not obstructed from the close by any occurring obstacle whatsoever?

Having discussed the role of sound as a medium of communication in the animal kingdom, Ibn Sīnā proceeds to explain the role of sound among humans. The continued existence of humans relies on collaboration and cooperation among us. It is therefore essential for humans to express their feelings and to be able to understand the feelings of their conspecifics. This should be obtained through a natural and simple tool or medium and *one which disappears after the act of communication has terminated*. The need for such communication required further, he continues, the addition of another device beyond simple vocalisations: deflections of the voice according to conventions (articulated speech) which differentiates the voice from its natural manifestation so that humans would be able to express their thoughts and use their imagination without any limitations. This contrasts with the animals for whom collaboration is mostly limited to moments of reproduction, and hence only use the voice in its natural form.

> And regarding the human, then the need leads him to bring others to know what lies within his soul, and to request to know what is within the soul of others, since the existence of his species is based on sharing (*mushāraka*), and isolation deprives him of the supply of necessities, and deprives him of basic life necessities, as you knew this, or will know [by encountering this fact] in places (*mawḍi'*) other than this, and the request [desire] of informing the others (*i'lām*) [of the state of his soul] or the request [desire] of knowing the [thoughts of the] other requires action which fulfils both desires, and this action must be easily created, and [such that] the natural instruments(*ālāt*) [organs] can meet this need, and such that it quickly vanishes after fulfilling the needs, and then the human being was also in need of ploy [strategy] (*ḥīla*) such as deflections of the voice which narrows (*tuḍayyiq*) [the distance to] the goal of what it contains [and serves] naturally and it necessarily requires the use of conventions so as to befit the different goals, which are almost not limited within a limit which includes that which he uses from imagination.

An interesting feature that Ibn Sīnā adds here is the ephemeral or transient nature of sound (i.e. its disappearance once it has been emitted). Ibn Sīnā does not give any explanation as to why he adds this feature but one can assume that if sound is used for communication, the silence after a call or an act of speech is necessary for hearing the other, but is also

[43]Ibn Sīnā's definition of '*existents*' can be found in his book of *Shifā'*, in his chapter on metaphysics (Chapter V). See Harvey, *Anthology*, p. 179.

https://doi.org/10.1017/S1356186319000178 Published online by Cambridge University Press

experienced as a moment of distress as one awaits a response. This seems to be a viable interpretation if one reads this section in retrospect, after one has read Ibn Sīnā's description of the emotional effects of the interplay between notes and silence in a melody. In any event, the fact that sound vanishes seems to be a central feature for Ibn Sīnā since he immediately reiterates it in his interim summary of his ideas thus far. In this summary, he adds an emphasis on the function of the voice as related to the expression and regulation of strong emotions. He summarises thus: "since voice is used for the reasons stated above (different forms of communication), and since it is not permanent but appears and then vanishes, we have a natural "longing" (tendency) for using it when distressed. This urge is common to both humans and animals, but humans add the artificial (conventional) to communicate their feelings and thoughts freely. Thus all living creatures use sound/voice to sooth sorrow or pain and to express their emotions "if overwhelmed by strong pleasing or offensive motive".

And as the reason for which vocalisation was created is that which we have mentioned, and given the fact that sound does not persist, but occurs and vanishes, a longing (*shawq*) for it [vocalisation] was created by nature when urgently turning to it upon the appearance of hated symptoms [danger] (*al-'awāriḍ al-makrūha 'ighrā'an*), in both the rational (*nāṭiq*) [speaking] and non-rational [non-speaking] animal, and a differentiation between the natural and artificial (*ṣinā'ī*) was made in it, making the living rely on it (*yaskun ilayh*) [tranquilised by it] if grieved by sorrow or pain, and rely on it to express [their feelings] if overwhelmed by strong pleasing or offensive motive.

One step down from the top of the hierarchy of the effects of sound, we find the voice organised in "correct proportions" and order (as in poetry and music). These qualities move the soul even more profoundly and capture the listener's attention: "the charm of composition joins that of sound". Understanding of order requires finer perceptive and intellectual powers, such as those found in the poet, overlaid on our natural desire and inclination towards sound/voice. Ibn Sīnā then adds the layer of articulated sound (speech) where ideas are combined with sounds by convention and used "instinctively" by humans to express themselves. The natural and conventional are used together to influence the listener. Ibn Sīnā gives specific examples that are very much associated with ethology: lowering the intensity of the voice when hiding, expressing obedience or pleading (thereby showing weakness, impotence and the right to mercy); or, by contrast, using a loud, brisk voice for expressing threat and potency.

Having laid down the different layers of the functions and effects of sound—from the very basic biological function of re-encountering a potential mate, through to speech with its underlying natural tone modulations, to articulated speech, and that overlaid by order and composition as in poetry—Ibn Sīnā finally reaches the pinnacle of the use of sound: music. He returns to the idea, already presented in his opening statements, that the enjoyable nature of music goes beyond the sensory and sensual level, since order and correct proportions are perceived by the intellect. Following the Aristotelian tradition, he ascribes music's powers to mimesis and its ability to instil good or moral characteristics within the soul, as if "giving it this quality or any of its sister qualities".

Whereas composition (order) and mimesis are common to the other arts and are concepts derived from the Aristotelian tradition, Ibn Sīnā adds yet another explanation as to why music has the power to enchant us. This explanation is utterly novel, unique and beautifully

ties together the aesthetic with the functional or even psychological. Order and composition in music are conceived of not only as an abstract feature; rather, they capture something unique about the behaviour of sound, as discussed in the previous paragraphs, dedicated to its functional aspects, namely the evanescence of sound, which leads to dread when it disappears and joy and pleasure when it reappears. This psychological account is very different from the physically oriented description of melodies as given, for example, by the Ikhwān el Safā. In their Epistle they do talk about "movement and rest" but only as a physical requisite for defining "notes and measured beats": "…music (*ghinā'*) is made up of melodies (harmoniously) composed, that a melody is composed of notes and measured beats and that the notes and measured beats cannot be produced except in a succession of alternated movements and rest".[44] In our view the link offered by the repeated references made by Ibn Sīnā to the longing for sound, on the one hand, and its disappearance, on the other, attests to the fact that for Ibn Sīnā the functional and the aesthetic are layered rather than juxtaposed, as seen below:

> Moreover, imitation (*muḥākā*) is pleasant especially among humans, and if an interval (*naghama*) imitates one of the good qualities (*shamā'il*) it is as if it deludes the soul into adapting to that quality and to whatever pertains to it. And then, vocal composition (*ta'līf ṣawtī*) is very pleasant for these reasons, I mean because of the order found in it which reaches the discerning faculty, as if this is a trait unique to it beyond the sensual power, and because of its ability to imitate the good qualities, and because the vocal composition has a unique trait that other compositions do not possess of, and this is because the first note (*naghama*) of two composed notes [interval] for example, makes the soul rejoice at it, its very rejoicing at it [like] every beloved thing newly arrived at, then it moves (*tataḥarrak*) after it has dwindled because of that which disappears quickly—something that is difficult for the soul, then this dwindling is rectified, and this break is followed, by the emergence of another note similar to the first one, as it returns in a new form, which has an appropriate proportion to the first one. And indeed, you already know that the strongest reason for pleasure is an abrupt sense of an appropriate thing, with the sensation of damage due to its absence, then what happens to the voice upon abruptly visiting the soul, and afterwards abruptly separating therefrom, and subsequently rectifying the dread of separation by the joy of returning in a form dear to the soul, I mean the order, which is the greatest of all human pleasures. And for this reason the soul passionately loved the composition of voices and the organisation of percussive rhythms which allows the soul to imagine the sounds/voices or approximate them in the human nature. Let us now hurry into the essence of the science to which we dedicate this tract.[45]

In drawing a direct line from animal vocalisations to language and music, Ibn Sīnā positions music as a form of communication. He does not make direct claims as to the temporal precedence of music over language—a topic that became central in the West much later, in the 18th and 19th centuries among figures like Rousseau,[46] Diderot,[47]

[44]As translated in Shiloah, *The Epistle*, p. 22.

[45]Ibn Sīnā, "*Jawāmi' 'Ilm al-Mūsīqī*", pp. 8–9.

[46]Jean-Jacques Rousseau, *The Collected Writings of Rousseau*, Vol. 7: *Essay on the Origin of Languages*, (translated and edited by John T. Scott (Hanover, London, 2009).

[47]Denis Diderot, *Collection complette des ouvres philosophiques, littéraires et dramatiques de M. Diderot*, Vols 1–5 (Amsterdam, 1793), Eighteenth Century Collections Online, Gale. British Library.

Spencer[48] and Darwin.[49] Nonetheless, one could argue that music is presented by Ibn Sīnā as a higher form of sound organisation that followed, rather than preceded, language. Notwithstanding, this issue is clearly not the focus of Ibn Sīnā's claims. His main contribution is his suggestion that higher forms of communication, including music, retain some of the aspects of basic emotional communication (stress calls and the sense of agency) which are partly driven by the characteristics of sound. These aspects are unique to the art of music and give it its special power. In this respect his argument resonates with current views that make a claim for the phylogenetic continuity of vocal communication from a very different ontological position by drawing a line from animal vocalisations and their associated emotions and reward mechanisms, through to infant-directed speech, up to claims for a common code for expressing emotions in speech and music.[50] Interestingly, Ibn Sīnā draws upon the connection between music and basic forms of communication to outline how music induces a flux of emotions, moving from joy when a note is heard, to dread and sorrow when it disappears and rejoicing at the reappearance of another note. Calling attention to this flux is in itself a novel observation. Again, this claim is before its time since it is concerned with questions of expressing a flux of transitions, from tension to relaxation, which emerged much later in the West in various writings that are associated with contrapuntal and harmonic progressions.

In summary, our close reading of Ibn Sīnā reveals how consistent and coherent he is in his writing, despite what seems, on the surface, to be a winding and opaque style. Moreover, this coherence extends beyond his introduction to the philosophy of music to his writings on perception and mental faculties, both of which show a similar model of hierarchies. Consistency and coherence alone, however, would not have made Ibn Sīnā the great philosopher he is. A glimpse of this greatness is revealed in his introduction in the way in which he takes the mostly well-known ideas of his Greek and Arab predecessors and threads them into a new perspective on the origin and power of music. [8] <roni.granot@mail.huji.ac.il>, <nabil.shair@mail.huji.ac.il>

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[48]Herbert Spencer, "The Origin of Music", *Mind*, 15, 60 (1890), pp. 449–468; H. Spencer, *Essays: Scientific, Political and Speculative*, Vol. 2 (London, Williams and Norgate, 1891).

[49]Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, Vol. 2 (New York, D. Appleton and Company, 1871).

[50]Charles Darwin, *The Expression of the Emotions in Man and Animals* (London, John Murray, 1872). For a review, see Patrick Juslin and Laukka Petri, "Communication of Emotions in Vocal Expression and Music Performance: Different Channels, Same Code?", *Psychological Bulletin*, 129, 5 (2003), pp. 770–814.