

SIC ET NON

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**PHILOSOPHICAL PSYCHOLOGY
IN ARABIC THOUGHT AND THE LATIN
ARISTOTELIANISM OF THE 13TH CENTURY**

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AVICENNA ON MUSICAL PERCEPTION

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Most of the studies dealing with inner senses in Arabic psychology are dedicated to the commentaries or paraphrases on Aristotle's *De anima*. Almost all of them exclude musical treatises. The contributions of al-Kindī, al-Fārābī and Avicenna to the philosophy of music have been left out of the conversation. By this, I mean not only their musical theories (understanding of harmony, rhythm and melody) or their innovating observations on composition¹, but also their theories of musical perception. In this paper, I focus on Avicenna's philosophy of music and relate it to his psychology. The Persian philosopher gives a functionalist² account of the origin of meaningful sounds, i.e. voices (music among them), as well as some references to the interaction between hearing and internal perception. Avicenna shows that animals can articulate meaningful sounds, even though they cannot compose music.

First of all, I explain the relation between sound and hearing. Their relations, as well as their distinctions, establish that there are some sounds in which meaning goes beyond mere hearing, i.e. voices and music, which

1. In this regard, the work of Henry George Farmer is an essential reference. Farmer explored the influence of Arabic musical theories in the shaping of Western music, its contribution to the creation and refinement of musical instruments as the lute ('ūd), the *rabāb*, the guitar (*qitār*) (see FARMER [1925], 61-80), and even the influence of al-Fārābī and some other writers in the development of Western music. See FARMER (1932), 561-592; (1959-61), 37-47. RANDEL has also studied the presence of al-Fārābī in Latin musical theories (1976), 173-188.

2. By 'functionalism', I mean that some functions, in this case, the articulation of language, appear for teleological reasons. I am not referring, hence, to a strictly psychophysical functionalism as stated by contemporary philosophers such as Putnam.

constitute a subclass of sounds. Following this line of argument, I examine what distinguishes music from articulated voices, the latter being present in some animals too. I will try to clarify the role played by imagination (*mutahayyilah*) in the configuration of language and music. Throughout these first two sections, I will point out some insufficiencies of the functionalist account of the origins of music and I will defend its imitative origin. Finally, in the last section, I will explain how these sounds relate to internal perceptive faculties (*hawāss al-bāṭinah*): musical creation and musical appreciation are mental acts tied to imagination (*mutahayyilah*) and to the estimative power (*wahm*). Musical appreciation, as presented by Avicenna, is not reduced to mere hearing or to proper conceptual knowledge. As we shall see, in musical appreciation the internal perceptive faculties interact with our thinking capacity (*fikrah*)³.

The estimative power is a leading faculty in musical appreciation since we understand intentions (*ma'nī*), i.e. *non-material* properties that exist accidentally in matter, and, therefore, are perceived conjointly with the sensible⁴. Furthermore, those 'musical meanings' are associated, as is every intention, to an emotion. If the latter can be a satisfactory explanation of musical perception, it prompts relevant philosophical questions: Can animals with an estimative power produce meaningful sounds too? If they can, are they capable of producing music? If they are not, why are they unfitted to do so, given that their cognitive faculties are so similar to ours? Can animals understand the intentional meanings present in melodies?

3. By 'thinking capacity', I mean discursive thinking and not the intellect's activity when it deals with universals. GUTAS (2001) holds that we can recognize two kinds of thoughts in Avicenna's epistemology: on the one hand, thinking as a function of the cogitative power (which is what I am referring to here); and on the other hand, thinking as an activity concerning only the intellect (thinking of universals would not be, in this case, something proper of the cogitative power but something belonging exclusively to the intellect). I agree with Gutas on the existence of two different activities. I do not believe, however, that the knowledge of universals involves the intellect exclusively. I think that the operations of the cogitative power are necessary for the intellective activity to take place and, of course, imagination is required as well. Despite this, I find Gutas' interpretation quite interesting, even though I accept the interpretations of DAVIDSON (1992), 99-102, and BLACK (1997), 425-453, which have been criticized by Gutas in note 45 of the referred article for not considering 'thinking' as an exclusive activity of the intellect independent of the internal senses.

4. Dag Hasse insists that Avicenna conceives intentions as non-material although merged (*muhālīqā*) with objects, and for this purpose, he refers to *De anima* IV.3. This, as Hasse claims, would be the key aspect for distinguishing Avicenna's doctrine from some contemporary theories of intentionality in which intentions are not in the world but only in perceptions or in the mind. See Dag HASSE (2000), 130.

Perhaps musical appreciation implies some intellection and, in this sense, the intervention of the cogitative power (*fikr*)?

I. SOUND AND HEARING

Avicenna dedicated a part of his most important work, the *Kitāb al-Šifā* (*The Book of Healing*), to music⁵. He treats of it in the third section of the book in which he deals with mathematics. Just like al-Kindī, Avicenna is greatly indebted to the general principles of the Pythagorean conception of music and consequently accepts that music has a mathematical structure⁶. Nevertheless, in his exposition he does not completely agree with Pythagoreanism⁷, and he follows some Peripatetic remarks from Aristoxenus⁸.

5. The edition I use is IBN SĪNĀ, *al-Šifā*, ed. Zakariyya Yousef. All the translations of the quoted passages are mine. The French version of ERLANGER (2001) has been very helpful; this is a valuable translation, although it does not grasp some of the subtleties of the philosophical terminology.

6. AL-KINDĪ, *al-Musawwītāt al-watariyyah, Mu'allafāt al-Kindī*, ed. Zakariyyah Yousef, 18.

7. As it is well known, among Pythagoreans there was a cosmological doctrine based on the notions of order and harmony. As stated by AETIUS in *Aetii Placita*, the Pythagoreans were the first to use the term *kosmos* to refer to the set of all things that compose the world and, in addition, they maintained that a mathematical structure underlies the universal order. Furthermore, according to the Pythagorean cosmology and metaphysics, harmony rules everything in the *kosmos* and it is specifically reflected in the harmonic proportions of the universe. That is why music works as an explanation of the *kosmos*. Also for this reason Aristotle says in his *Metaphysics* (1090a, 20-25) that Pythagoreans: "[...] saw many attributes of numbers belonging to sensible bodies, supposed real things to be numbers – not separable numbers, however, but numbers of which real things consist. But why? Because the attributes of numbers are present in a musical scale and in the heavens and in many other things". This thesis of musical harmony in the *kosmos* is the same as the one found in Plato's *Timaeus*. There, another Pythagorean idea is also present: cosmic harmony is proportional to the harmony of the soul. The analogy between cosmic proportion and *psychic* or *animic* proportion explains why we listen to music with pleasure: at the moment of musical appreciation, the soul and the world are tuned. Now, in the *Fihrist* al-Nadīm mentions the work of the Pythagorean Nicomachus of Gerasa. He is the author, as it appears in the catalogue of the tenth century, of a treatise called *On Arithmetic* and another called *On Music* (see IBN AL-NADĪM, *Fihrist*, trans. B. Dodge, 643). The work of Nicomachus of Gerasa influenced al-Kindī who, among others works, he wrote seven musical treatises. FARMER (1930, 325-333) is an essential source for the Greek influences on Arab theories of music.

8. In the *Fihrist* al-Nadīm mentions the Peripatetic philosopher Aristoxenus, one of the most prestigious authorities on music. He wrote, according to the *Fihrist*, the treatises *On Rhythm* and *On Harmony* (AL-NADĪM, *Fihrist*, trans. B. Dodge, 644). Aristoxenus was Aristotle's disciple and argued for a wider understanding of musical appreciation, going

and, of course, from al-Fārābī⁹. The Peripatetic influence on Avicenna is important since it is most probably the point of departure for his theory of musical perception.

beyond the definition of harmony and postulating a theory of auditory perception. Aristoxenus is extremely Aristotelian when privileging a theory of hearing (in *De anima* Aristotle dedicates vast passages to visual perception and Aristoxenus does the same but with regards to the ear). He is practically a modern, almost an empiricist critic of the Pythagorean mathematical-intellectualist conception of music. This does not mean that harmony is not mathematical. Rather, harmony is not grasped without rhythm, metre and composition. The ear grasps intervals and rhythms and without that sensorial experience it is not possible to recognize the essence of music, i.e. harmony. For more details on Aristoxenus's musical theory see WINNINGTON-INGRAM (1932), 195-208.

9. Al-Fārābī wrote *The Great Book of Music* (*Kitāb al-Musīqā al-kahīr*), a treatise *On Melody* (*Fi'l-Īqā'*) and the *Transition to Melody* (*al-Nuqlah ilā'l-Īqā'*). In his *Enumeration of the Sciences* (*Ilhās al-'ulūm*), known in the Latin West as *De scientiis*, there is a section where the theoretical and practical dimensions of music are explained. Some biographers attribute to him the invention of a musical instrument called the qanun. Others simply mention that he was an excellent laud player. We find in al-Fārābī's writings the most novel conception of music within the Arabic-Muslim world. In his writings, he is interested in defining what the principles of the musical science are and, following a typically Aristotelian methodology, he deals with the previous claims and mistakes of previous conceptions of music. Obviously, the Pythagorean conception of music appears in his historical inventory and he considers it incomplete and deficient in some regards. In some way, al-Fārābī places himself within the Peripatetic tradition so that even if he finds an evident relation between music and mathematics – just as Pythagoreans did – he thinks, nonetheless, that the essence of music is not number but melody. The pleasure and displeasure we experience in presence of a musical piece comes only from melody and that pleasure has nothing to do with heavenly spheres, as the Pythagoreans thought. In fact, according to al-Fārābī, music is almost synonymous with melody (*alhān*), and melody must be understood as a set of audible tones combined in a particular way, namely, intervallically and rhythmically. The musical theory of al-Fārābī resembles his poetic theory. He relates to musical appreciation a definitely novel element: imagination. Melody can be twofold: internal or imaginative (and by this al-Fārābī refers to the fact that we imagine melodies, and can actually execute them with the hands, such as percussions and strings, or with the mouth, as happens with wind instruments). The most interesting part is the association between melody and imagination. As far as I know, no musicologist of Antiquity noticed the importance of imagination for the creation of melodies. Imagination is capable of evoking absent objects, of recreating them, of making them present. Within Arabic aesthetics imagination plays a definitive role and al-Fārābī is a good example. In some of his writings devoted to poetical discourse, the philosopher insists on the importance of images for persuading, even for fixing convictions. When words are needed, as in the case of poetry, imagination takes mainly a visual role. In fact, many theoreticians of imagination, not only of Antiquity but also of the seventeenth and eighteenth centuries and even some contemporaries, erroneously reduce imagination to a mere visual faculty. Strange as it may seem, we can also imagine aromas and even sounds, as al-Fārābī suggests. In a way, al-Fārābī postulates an "auditory imagination". The 'objects' that this faculty produces are melodies. The drafter and the sculptor imagine beautiful and attractive forms; the musician

As Shehadi (1995, 67) has pointed out, the third section of the *Šifā* or *Healing* presents rudiments of an aesthetical analysis of music and a psychobiological account of aesthetic appreciation. In my opinion, such rudiments are important in order to recognize the role of the internal senses in musical appreciation. Throughout Avicenna's discourse, some Aristotelian accounts of the *De anima* are present along with references to some other Aristotelian biological works such as the treatises on animals¹⁰.

After a short allusion to what others have understood by musical science¹¹, Avicenna explains what ought to be understood by "sound" (*ṣawt*) and immediately starts speaking of the perception of delightful (*ladīd*) and hateful (*takariha*) sounds:

imagines agreeable melodies. This, however obvious or strange, is in fact revealing: al-Fārābī would argue that the eyes serve not only to see and the ears not only to listen, but also to delight us. For all this, one thing is the simple sensorial stimulus (see any object or listen to any sound) and another thing is the pleasure attached to the stimulus. Al-Fārābī to some extent anticipates one of the richest empiricist theories of imagination of the eighteenth century, namely, that of Joseph Addison in *Pleasures of Imagination*. In this work a similar thesis is found but is applied to visual imagination: the eye sees, but the imagination recreates and makes pleasant the visual stimulus. Something similar would happen with auditory imagination in al-Fārābī's case: the musician reinvents brute sounds transforming them, thanks to imagination, into something pleasant. For a thorough exposition of music in al-FARĀBĪ see *Grand traité de la musique*, trans. Erlanger, 1-101; FARMER (1932), 561-92; and RANDEL (1976) 173-88.

10. As it is well known, the Arabs gathered the Aristotelian works on animals in a single book entitled *The Book of Animals* (*Kitāb al-hayāwān*). The Syriac and Arabic versions integrated nineteen books distributed as follows: ten books of *Historia animalium* (the tenth spurious book was included), five books of *De generatione animalium* and four books of *De partibus animalium*. The Latin translation of Michael SCOTUS, *De animalibus*, ed. Van Oppenraaij, Part III, xv-xix *Generation of animals* and Part II, xi-xiv *Parts of animals*, is well known, and it served as the basis for Albert the Great's *Quaestiones super libros de animalibus* and *Reportatio de animalibus*. It was also Michael Scotus who translated the eighth section of the philosophy of nature of the *Šifā* dedicated, precisely, to animals: *Compendium Avicennae de animalibus*. The Syriac, Arab and Latin reception of the works on animals is detailed in the known work of PETERS (1968), 47-8. Regarding the translation of Michael Scotus see WINGATE (1931), 72-85.

11. Shehadi pays attention to this introduction, because Avicenna refers there to the necessity of going beyond the Pythagorean conception of music and even presents some critiques against Neopythagorean ideas. In fact, as CRUZ HERNANDEZ (1981), 31-2, points out: "The sources of the rejected Neopythagorean ideas seem to be the second book of the *Republic* and book A of *Metaphysics*. Instead, the origin of Ibn Sīnā's theory is mainly in the second book of *De anima* and in *De sensu et sensato*; secondarily, in *Peri hermeneias*, *Historia animalium* and, maybe, in *Problemata*. The texts of *Politeia* must be rejected. Ibn Sīnā and beside him all the Islamic thinkers were ignorant of this work of Aristotle".

Therefore, I say that sound is one of the exterior manifestations that our senses perceive [with] the feeling that it can be pleasant for us. I refer here to the sound quality that makes it pleasant or unpleasant to the ear, and not to the negative effects resulting from an excess that may be abnormal. Sound is, indeed, like all the other sensibles. Thus, a smell may be disgusting because of its nature, as it happens with different things, even if it is low and hidden, or by its excesses, [as it is the case of,] for example, the pleasant smell of the musk: if it is too strong, it will be unpleasant, just as we suffer a painful sensation with the sun's rays excesses when they are normally beneficial [if they are moderate].

The sound sensation cannot be pleasant or unpleasant itself; our ear suffers only when it is too violent. A musical instrument, played too loudly, produces a disagreeable sound that we instinctively reject. In a different way, however, a sound can be pleasant or unpleasant, not qua sensation, but in its relation to our ability to understand, which considers the idea that the sound reminds us of the role that it plays in a composition. We have also clearly explained the function of the faculty of understanding possessed by humans and animals, so we do not say anything here ¹².

This description of sound is fundamentally psychological. Avicenna clearly states he is referring to certain qualities of sounds, which will contribute to the pleasantness or hatefulness of auditory perception. He seems to leave aside the problems related to the excess of sensory stimulus excesses (the excess of light damages the eye or an extremely loud sound will affect the ear and both experiences turn out to be unpleasant). However, besides discussing why a sensory stimulus would be unpleasant, a reason for the opposite effect should be found, namely, why some stimuli are pleasant. Perception of something unpleasant, at least as it is described in these passages, implies a violent action upon the external senses and, as such, it seems to be a physiological explanation. What Avicenna tries to explain surpasses the mere physiological comprehension of sensation. It is, I insist, a psychological approach that tries to explain why certain sensible qualities please us and even why others displease us without it being necessary for us to experience the excesses of a sensory stimulus.

If a purely physiological understanding of sensation suffices, an approach to musical perception would be impossible. In order to achieve it, it does not suffice for us to explain in which way vibrations affect our ears. We have to explain what makes musical sounds agreeable. In order to do this, it is necessary to begin with a physiological account and later move on

12. AVICENNA, *al-Šifā, Jawāmi'* 'ilm el-mūsīqā, I, 1: 4, 15-5, 5.

to a psychological explanation. In canonical treatises like the *Šifā* and the *Kitāb an-Najāt* (*The Book of Salvation*) the physical descriptions of hearing that can be found are, in my opinion, implicit in the Avicennan conception of music. For example, in *Šifā, an-Nafs*, 2.5, 82ss we find a detailed study of hearing (*samā'*) and, before, in *Šifā, an-Nafs* 1.5.41-42, when Avicenna talks of perception in general, there are already descriptions like the following:

The faculty of perception has two divisions: that of external perception and that of internal perception. The faculty of external perception comprises the five, or eight, senses. These include sight, which is a faculty arrayed in the concave nerve that perceives the form of what is imprinted on the vitreous humor, that is, the images of the bodies possessing color that are transmitted through the actually transparent bodies to the surfaces of smooth bodies. Another sense is hearing, which is a faculty arrayed in the nerve dispersed on the surface of the ear canal that perceives the form of what is transmitted to it from the oscillation of the air that is compressed between what causes the disturbance [of the air] and what, with resistance, receives the disturbance, the air being compressed by a disruption that produces a sound. In this case, the oscillation of the air is transmitted to the still air enclosed in the chamber of the ear canal, and makes it move in the pattern of its motion, and the vibrations of that motion touch the nerve, and one hears ¹³.

In this description, Avicenna is clearly distinguishing between sound and hearing (see also *De anima* II 8; *Šifā, an-Nafs*, 2.5.85-86). Sound is a physical phenomenon, while hearing is a biological phenomenon and, as I have already showed, a psychological one too. Sound precedes hearing and does not presuppose it since it actually gives rise to it. Hearing is posterior and presupposes sound, which is its proper object. Avicenna, like Aristotle, considers the physiological structure of the ear because it is what

13. AVICENNA, *Šifā, an-Nafs* 1.5.41-42, 180. Avicenna writes in *an-Najāt*, trans. F. Rahman, 26: "The perceptive faculty can be divided into two parts, the external sense and the internal sense. The external senses are the five or eight senses. One of them is sight, which is a faculty located in the concave nerve; it perceives the image of the forms of colored bodies imprinted on the vitreous humor. These forms are transmitted through actually transparent media to polished surfaces. The second is the sense of hearing, which is a faculty located in the nerves distributed over the surface of the ear-hole; it perceives the form of what is transmitted to it by the vibration of the air which is compressed between two objects, one striking and the other being struck, the latter offering it resistance so as to set up vibrations in the air which produce the sound. This vibration of the air outside reaches the air which lies motionless and compressed in the cavity of the ear, moving it in a way similar to that in which it is itself moved. Its waves touch that nerve, and so it is heard".

makes hearing possible. Now, sound, just as Aristotle remarks, is produced when two solid bodies hit each other: "the sound actually produced is of something striking against something else in a medium"¹⁴. So it is explained by Avicenna:

The sense of hearing, which is a faculty located in the nerves distributed over the surface of the ear-hole; it perceives the form of what is transmitted to it by the vibration of the air which is compressed between two objects, one striking and the other being struck, the latter offering it resistance so as to set up vibrations in the air which produce the sound¹⁵.

In order for sound to take place it is necessary that two objects hit each other, but besides, those objects need to be hard, plain, hollow and the striking must start in a continuous medium, such as air or water. In this way, just as it is described in *De sensu* 6, 446b30ff. and in *De audibilibus* 800a1ff., the movement of the medium is transmitted to the ear. Avicenna, following Aristotle, holds that air works as a medium of transmission of sound, but also, as can be inferred from the previous passage, he claims that the principal agent of sound is not exactly air, rather it is the vibrations produced when two hard objects strike each other and against the air¹⁶. Aristotle believes that the main agent of hearing is vacuum¹⁷. Air is not sonorous because it is easily disaggregated, but if it is restrained, its movement becomes sound. An object is sonorous if it is capable to set a continuous mass of air in motion up to the ear¹⁸. It is because of this that wool or sponges cannot produce any sound despite being hit, while bronze can. Following Aristotle, Avicenna affirms that the movement of the stars cannot produce sound either (see *De caelo* II, 9; *Šifā, Jawāmi* 'ilm el-mūsīqā I, 1: 4, 5). Now then, the ear is naturally adapted to air because it is immersed in air and, when the outer air moves, the inner air moves too¹⁹.

The sonorous variations oscillate between the high and low tones, so the ear is a kind of middle term (*mesôtes*) between one and another extreme. This description coincides, as can be seen, with the one made by Aristotle of the other external senses. In short, the ear can grasp a wide

range of sonorous variations that oscillate between high and low tones²⁰. Both Aristotle and Avicenna agree that without sound there is no hearing and that, even though they are different things, in the act of auditory perception they become one and the same thing²¹.

After the analysis of hearing, Aristotle deals with a related subject, namely, voice. Dealing with voice is pertinent because it is the kind of sound that living things emit, and because of it, it is clear that voice adds perfection to sound. Avicenna takes up again this issue in the introduction of the section dedicated to music²². Living things grasp but also emit sounds full of meaning. This is precisely the functionalist explanation I referred to in the first lines: the meaningful sounds, i.e. voice, are basic for animal communication.

In regard to the last issue, Avicenna appeals to a series of biological considerations that, undoubtedly, takes into account Aristotle's writings concerning animals. Avicenna explains that, since nature is a manifestation of God, He decided to regulate the functions of living creatures in order to preserve the species and, for this reason, animals reproduce. Reproduction urges animals to unite and, for it, nature has endowed them with a certain capacity to communicate their presence to other members of their species through certain communicative capacities:

The imperative need for the reproduction of the species encourages the animals to come together, to couple after being separated [sic]. Nature gave them the skill to call, to report their presence, and they also use this ability in other circumstances, such as to report an unseen danger. These are obvious things that are confirmed by experience, so we have no doubt that the Creator takes care of his creation. God's Providence attends to the needs of his creatures and provides them with things that are necessary and useful²³.

Animals have certain communicative capacities that enable them to associate, to mate, and as can be read in the passage, to report some experiences like danger. The grasp of danger is possible due to the estimative faculty, which makes animals both capable of understanding

14. ARISTOTLE, *De anima* II 8, 419b9.

15. AVICENNA, *an-Najāt*, trans. F. Rahman, 26.

16. ARISTOTLE, *De anima* II, 8, 419b20.

17. ARISTOTLE, *De anima* II, 8, 419b34.

18. ARISTOTLE, *De anima* 420a ss.

19. ARISTOTLE, *De anima* II, 8, 420a5-10.

20. In this respect, Aristotle offers a physiological account in *De anima* 420a28-420b1: "But the differences in things which sound are shown in sound actually realized; for just as colors cannot be seen without light, so sharp and heavy noises cannot be distinguished without sound. These terms are used by analogy from the sense of touch. The sharp sensation excites to a great extent in a short time, the heavy to a slight extent in a long time".

21. AVICENNA, *Šifā, an-Nafs*, 2.5.85-86.

22. AVICENNA, *Šifā, Jawāmi* 'ilm el-mūsīqā, I, 1: 5, 15.

23. AVICENNA, *Šifā, Jawāmi* 'ilm el-mūsīqā, I, 1: 5, 15.

hostility and friendship and of making the other members of their species aware of a given state of affairs. Now, if animals are able to communicate amongst themselves, this means that they are able to emit meaningful sounds, i.e. voices. Avicenna holds that animals emit sounds that are either a call of danger or an expression of pleasure and pain. In my opinion, animals can emit voices with meaning because of two main reasons: a) their physiological constitution and b) their cognitive faculties.

In *Šifā, Jawāmi' 'ilm el-mūsīqā*, I, 1, Avicenna does not treat animals' physiological dispositions in sufficient detail to explain why some of them have voices. He only mentions that Nature has endowed some animals with an organ that enables the emission of useful sounds so that they can understand each other. That would work as a preamble to demonstrate that in animals—including human beings—there is a natural disposition to sound, that the latter is necessary to survive and that, among animals, human beings are the only ones able to give harmony to sound. The introduction of harmony, i.e. music, in Avicenna's argument is somewhat abrupt. The difference between sound and music would be, up to this point, harmony. But there is more to the definition than this: if some animals can emit meaningful sounds, their physiological structure should be disposed for it. Avicenna presupposes that animals that emit voices are precisely those that have both external and internal perception. We can infer that in his studies on music Avicenna gives a definitive relevance to sensation: animals have certain perceptions of the world and Avicenna claims that animals report such sensitive experiences (danger or pleasure) through sounds directed toward the world. If animals did not have the support of relevant organs, they could not emit sounds with meaning. Even the internal senses do have a location in the brain. This physiological disposition of the cognitive faculties enables the sensitive soul to link perception with the world. The internal faculties play a relevant role in this process, especially, imagination and the estimative power. But before examining this point more closely, it is convenient to recall a passage where Aristotle insists on the relation between the physiological disposition and the capacity of emitting voices:

Voice is the sound produced by a creature possessing a soul; for inanimate things never have a voice; they can only metaphorically be said to give voice, e.g., a flute or a lyre, and all other inanimate things which have a musical compass, and tune, and modulation. The metaphor is due to the fact that the voice also has these, but many animals—e.g., those which are bloodless, and of animals which have blood, fish—have no voice. And this is quite reasonable, since sound is a kind of movement of the air. The fish, such as those in the Achelous, which are said to have a voice, only make a

sound with their gills, or with some other such part. Voice, then, is a sound made by a living animal, and that not with any part of it indiscriminately. But, since sound only occurs when something strikes something else in a certain medium, and this medium is the air, it is natural that only those things should have voice which admit the air. As air is breathed in Nature makes use of it for two functions: just as she uses the tongue both for taste and for articulation, of which taste is an essential to life (and consequently belongs to more species), and articulate speech is an aid to living well; so in the same way she employs breath both to conserve internal heat, as something essential (why it is so will be explained in another treatise), and also for the voice, that life may be of good standard ²⁴.

Which animals emit meaningful voices? In *Historia Animalium* IV, 9, 535b3ss. bees, cicadas and crickets are excluded. Instead, in *Historia Animalium* IV, 9, 535b32-536b23 animals with the right physiological apparatus are included, namely, those with lungs, trachea, and larynx: mammals (human beings included), four-legged oviparous animals, and birds. Almost all fish lack voice. Almost all water creatures in fact lack voice, with the exception of perhaps the most studied sea mammal within contemporary cognitive sciences: dolphins. Dolphins, unlike fish, have lungs and trachea and therefore are able to emit voice. The same happens with other sea mammals like whales, sea lions, or seals.

Avicenna does not pay a lot of attention to physiological details like the ones I have described. Nevertheless, it is easy for him to tell the importance of the internal faculties for musical perception. And this is so because besides physiological constitution, voice-emitting animals require specific cognitive faculties. They need at least one internal sense, namely, imagination. Aristotle affirms that:

For, as we have said, not every sound made by a living creature is a voice (for one can make a sound even with the tongue, or as in coughing), but that which even causes the impact, must have a soul, and use some imagination (*phantasia*); for the voice is a sound which means (*semantikós*) something, and is not merely indicative of air inhaled, as a cough is ²⁵.

This text is relevant because coughs and sneezes are not voices because they are not associated to any representation (*metá phantasías tinós*). Vocal sound being associated with an act of imagination implies that this vocal sound has meaning (*psófos semantikós*). Now, if it has meaning, it cannot be an operation explained through a merely mechanic action, it is

24. ARISTOTLE, *De anima* II, 8, 420b5-23.

25. ARISTOTLE, *De anima* II, 8, 420b29-421a1.

rather explained because there is a sensitive soul, and because of it, the animal emits a sound semantically linked to imagination.

II. SOUND AND MUSIC

As we have just seen, voice is a sound associated with a representation, and this sound constitutes the most basic form of language. Both Aristotle and Avicenna accept that animals have a form of language, since nature has provided them with what is physiologically and cognitively necessary for it. It is relevant to clarify that even though voice is a form of sound (*sawt*)²⁶, the latter is not yet a form of language. However, we should ask if meaningful sounds, i.e. voice, also explain the origin of music (*mūsīqā*). Avicenna abruptly introduces music when he is giving his functionalist account of language. There is, indeed, a thematic gap. Avicenna is explaining why animals manifest a natural disposition to sound and how it is useful for communicating amongst themselves, when suddenly he mentions that human beings are the only ones capable of organizing sound harmonically.

Shehadi also points out this gap in the argument. Until it occurs, Avicenna acts as a biologist in order to show how articulated language enables communication. However, one should ask if this functionalist approach tells us something about the origin of music. Music could be considered an articulated language, though this would be an unsatisfactory definition since not every articulated language is music. Shehadi (1995, 70) denies that a functionalist account of music's origin can be found in Avicenna, just as it is present in Darwin or Spencer. I share Shehadi's interpretation since if we were partisans of this type of functionalism: a) we would not have consistent reasons for explaining how articulated language becomes musical language, and b) we could hardly entertain an aesthetic account of music. In other words, functionalism would not give an answer to aspects related with the kind of musical perception we are here interested in: imagination and its creative capacity to structure sounds in a harmonic fashion and the pleasure or displeasure those sounds generate in us.

It is true that Avicenna introduces music abruptly, but it is also true that the characterization of musical composition offered there goes beyond the merely functional:

26. See AVICENNA, *Šifā, Jawāmi' 'ilm el-mūsīqā*, I, 1.

Man uses his voice's inflection and, conventionally, each of his inflections corresponds with an idea. The natural effects of sound have been enriched by those conventional effects thanks to human art. A voice, for example, if it murmurs at a certain time, and it starts over again after pausing, expresses weakness and impotence and pleads for clemency. If, on the contrary, a voice is high and brusque it will be threatening and it will seem strong and firm and will lead to obedience and, gradually, to absolute resignation²⁷.

However, I believe that the Avicennan characterization surpasses a sheer communicative conception of music and allows us to understand it from an aesthetic stance as well. To arrive at this point, it is necessary to refer to some observations from the section of the *Šifā* dedicated to *Poetics*. In this way, we can notice that just as animals have a natural disposition to sound, human beings seem to be naturally inclined to imitate. Avicenna clearly states that among living creatures, human beings are the only ones who are delighted with imitation²⁸. When he deals with music he seems to refer to a human natural disposition to discern well-combined sounds and to link them with Nature and with our characters:

Especially those things that make him remember other things do entice man; he therefore represents and imitates them. Some musical notes have the property of reminding us of some quality, and those notes provoke in us the impression that we possess that quality, the attributes of that quality, and its necessary consequences. This is why sonorous combinations seduce us. Our discerning ability, which has a different role from our faculty of hearing, recognizes in musical composition certain order and obtains from it different suggestions: that is what makes us find music agreeable.

27. AVICENNA, *Šifā, Jawāmi' 'ilm el-mūsīqā*, I, 1: 8, 5.

28. In AVICENNA, *Šifā, Kitāb al-shi'r* IV, 1 is read: "There are two causes that make the human mind create Poetry. One is the pleasure of imitating and the use of imitation from childhood. In this [men] differ from the speechless animals in that man is more capable of imitating than all other animals. Some of them are incapable of imitating at all, and some are capable of insignificant imitation, such as the parrot, by means of voice, and the monkeys, by gestures". Further on AVICENNA, *Šifā, Kitāb al-shi'r* IV, 3: "An evidence that imitation is delightful is that men are pleased by contemplating the portrayed forms of hateful and disgusting animals which they would avoid if seen in actuality. What is delightful is not that form itself nor what is portrayed but its being a precise imitation of something else. For this reason, learning is pleasant not to philosophers alone but to common people due to the imitation that is in it, and because learning consists of a certain representation of a thing in the 'seat' of the soul. Men, therefore, find a great delight in portrayed forms if they can well relate these to the originals".

A special quality of composition (harmony) that is strange to all genres of composition is for us another cause of enticement. It consists in the following: the first of two notes produces upon our souls an agreeable impression, as any unexpected and desirable thing. This sensation will be followed by another similar to it that provokes in us the sudden disappearance of a beloved thing of ephemeral duration. This recollection that followed pleasure disappears when the second note arrives. This will be for us nothing but the return of the first one under another form and the latter will be with the former as in a relation that corresponds to our ear. It is known, however, that among the causes of pleasure the main cause is the surprise we experience in the presence of a harmonic sensation after the return of some other previously erased. The unexpected sensation of sound, its sudden disappearance, and afterwards its return, as well as the seduction of the composition (harmony), yield the greatest and sweetest pleasure to the soul. This is why the ordered combination of sounds – its composition – deeply entices us, just as does the ordered and regular combination of rhythmic percussions. Both of these make us imagine sounds and approach them for their nature²⁹.

In musical perception the first things that fascinate us are the sensible qualities of sound and, more specifically, harmony. In the section dedicated to poetics in the *Šifā*, Avicenna affirms that, besides the natural inclination for imitation, we also naturally tend to harmony. In fact, in *Šifā*, *Kitāb al-shi'r*, IV, 4, when Avicenna announces the causes of human imitation, we read: “The second cause is men’s natural love of harmonious combination and melodies. The measures were found to be analogous to melodies; and consequently, the soul became favorably disposed to and thus [learned to] create them”. This inclination to harmony yields us pleasure, while the shared necessity with animals to communicate is not necessarily pleasant. There are reasons to privilege, say, a mimetic-natural origin of music instead of a functionalist one. In the passage just quoted, Avicenna refers to our capacity to enjoy music, which is not to be confused, as he explains, with the mere act of listening, since it rather appeals to our cognitive faculties. The passage suggests that only animals with certain cognitive faculties can appreciate music. I will insist on this in the next section. For now, it seems appropriate to explain the role of such cognitive faculties in the *Jawāmi’ ‘ilm el-mūsīqā*. I will defend the importance of imagination both in musical creation and in its perception. This takes us back once more to the origin of music: there is music because there is voice, even though not all voices are music.

29. AVICENNA, *al-Šifā*, *Jawāmi’ ‘ilm el-mūsīqā*, I, 1: 8, 10.

It is true that there is no meaningful voice without imagination. How is it possible that certain articulated voices do not limit themselves to communicative action, but also generate pleasure thanks to their harmonic structure, their tonality, their intervals (*ab’ād*), their rhythm (*‘iqā’*), and their melody (*lahn*)? To answer this question it is necessary to distinguish some capacities of the imaginative faculty. In fact, imagination is a faculty we share with animals. However, imagination is capable of interacting with other cognitive faculties that animals lack. In *Kitāb an-Najāt*, Avicenna distinguishes between rational imagination (*mufakkirah*) and sensitive or compositive imagination (*mutaḥayyilah*)³⁰. A basic and useful difference between humans and animals, despite all the similarities, is rational imagination. Imagination under the domain of the estimative power (*wahm*) is proper to animals; on the other hand, imagination under reason’s domain is proper to human beings. In the latter case, Avicenna uses the term *mufakkirah*, translated into Latin word as *cogitatio*³¹. Nevertheless, Avicenna insists that the cogitative power replaces neither imagination nor the estimative power in rational animals. Human beings actually have estimative power too. This clarification is relevant: only human beings have a cogitative power, whereas the estimative power is common to animals and humans. The latter is important in order to explain affective qualities (hostility, friendship, etc.), incidental perception, some of our ethical beliefs and creativity³².

My claim is that the distinction between *mutaḥayyilah* and *mufakkirah* is relevant to understanding how meaningful voices are articulated. I also think that the cognitive functions of those two faculties suggest how human beings are capable of articulating “conceptual language” and a subclass of it, namely, music. As I have said before, in order to emit voices with meaning a specific physiological apparatus (lungs and trachea) and a cognitive one (imagination) are required. I think that language is possible because *mutaḥayyilah* enables some kind of link or association between

30. AVICENNA, *Kitāb an-Najāt*, trans. F. Rahman, 31.

31. AVICENNA, *Šifā*, *an-Nafs*, I.5.45, 182: “Next is the faculty called the imaginative faculty in relation to the animal soul and the cogitative faculty in relation to the human soul. It is a faculty arrayed in the medial ventricle of the brain at the *cerebellar vermis*, whose function is to combine and divide at will any [forms] in the imagery. Thereafter, there is the estimative faculty, being arrayed at the back of the medial ventricle. It perceives the connotational attributes not perceptible to the senses but that are nonetheless in particular sensible objects, like the faculty in the sheep that judges that this wolf is something to flee and that this lamb is something to love. It would seem to operate also on objects of the imagination by combining and dividing them”.

32. BLACK (1993), 219-58.

voice and content. This would explain why some animals articulate meaningful sounds, indeed, for social convenience (functionalism). Animals do attain the articulation of certain sounds with meaning³³ that are associated with an emotion. It is clear that Avicenna admits that animal perception is directed toward the world and animals recognize meanings or connotational attributes (also called intentions).

I have already argued that humans have estimative power too—this explains the directionality of our knowledge toward non-material properties perceived through sensible—but the interaction of this faculty with other internal senses makes human knowledge superior to that of animals. It is clear that, following Aristotle, Avicenna is correct in that we cannot form concepts without images. This means that the intervention of imagination in knowledge is inevitable. Now, the interaction between *mutahayyilah*, *wahm* and *mufakkirah* in our rational operations is extremely relevant for Avicenna. In fact, although it is true that the intellect plays a privileged role in his epistemology, the internal senses actually play the leading role in knowledge. The internal senses make the intellectual operation possible and perform the functions of retention and reception of forms and intentions. In this way, the perceptive contents coming from the external senses are *received* by common sense (*ḥiss al-mushtarak*) and retained by the retentive imagination (*khayāl/muṣawwarah*); the estimative power (*wham*) receives intentions retained by the memory (*dhikr*); the compositive imagination (*mutahayyilah*) is a permanently active faculty which composes and divides both forms and intentions³⁴. This latter faculty can be dominated by the estimative power or by reason, as I have already said, and in the last case we would be dealing with *mufakkirah*, i.e. images controlled by reason.

This sketch of the internal senses mainly found in the second book of *Kitāb an-Najāt* and in the fourth book of *De anima* of the *Šifā* and even in the eighth lesson of the *Canon of Medicine* (*al-Qānūn fī 'l-tibb*), helps us understand: a) how we can articulate a more complex language than animals and, b) how we can create different forms of language, either figurative, poetic or musical, which are not related to communicative needs but to the creation of pleasure. I think we could claim that the difference

33. As Aristotle explains, some physiological factors such as an adequate tongue (wide and mobile) also intervene (ARISTOTLE, *Part. Anim.* II, 17, 660a25-27). The intervention of teeth and lips is evident in human beings.

34. A detailed account of the role of the internal senses in Avicenna and its reformulation in other philosophers such as Averroes, Albert the Great and Thomas Aquinas, can be found in BLACK (2000), 59-75.

between animal and human cognitive faculties is as follows: in animals there is a link between voice and intentions that allows for the creation of knowledge and a kind of articulation similar to language. But in human beings the interaction of our internal perceptive faculties with the intellect enables us to articulate a highly complex language alien to animals, since they lack a linguistic-conceptual apparatus.

In my view, with respect to (a), it is necessary to go deeply into the structure of human language. While some contemporary philosophers give priority to language over mental states, I hold that human language presupposes thought. In other words, humans have a conceptual apparatus that enables us to articulate language. In fact, when Avicenna conceives that *mufakkirah* is the anteroom of the judicative faculty, he is telling us that thanks to it we can have propositional attitudes towards the world. In fact, a propositional mental structure implies the possession of complex language. This last issue is an assumption of some of Avicenna's commentaries on works of logic like *The Book of Syllogism* (*Kitāb al-Qiyās*), *Remarks and Admonitions on Logic* (*Ishārāt wa-al-tanbihāt*), *Isagoge* (*al-Madkhal*), and *Peri Hermeneias* (*al-ibarah*). It should be kept in mind that the main interest of Avicenna in epistemology is the levels of abstraction and, in logic an essential topic for him is concepts (*tasawwir*). Hence, even though language—understood as a set of particular rules conventionally established—plays no essential role, we cannot say the same of the kind of language that I have called “conceptual language”, namely, the kind of language that enables us to establish a link between voice and concept. It must be kept in mind then that humans can articulate voices directed towards the sensible world and, in addition, voices directed toward mental concepts. Avicenna might concede that not all of our knowledge is propositional (for example, the connotational attributes that we recognize thanks to the estimative power), although he might argue that our nobler and higher way to know is conceptual knowledge.

Regarding (b), i.e. the creation of forms of figurative or musical language, it must be said that Avicenna gives a relevant place to imagination and, in fact, without it we could not even think universals; it is not strange then that images also enable us to compose figurative language. The compositive imagination would be interacting with the estimative power. The compositive imagination is capable of combining and dividing images, even involuntarily. The estimative power, then, enables humans to

compose voluntarily figurative language and imaginative discourse³⁵. It is precisely in his commentary to *Poetics* where Avicenna defines poetry as an imaginative discourse composed of expressions with measure, rhythm and, among Arabs, with rhyme. The opening passage of the *Kitāb al-shi'r* is relevant to our purpose:

We first say that poetry is imaginative speech, composed of utterances that are measured, commensurate and, in Arabic, rhymed. The meaning of being measured is that they have rhythmical quantity; the meaning of being commensurate is that each utterance, which is rhythmical, has a temporal duration equal to that of the others; and the meaning of being rhymed is that the letters that terminate each utterance are the same. The logician considers [poetry] only in so far as it is imaginative speech. Otherwise, the measure is the [proper] concern of the musicologist (in terms of investigation and general practice) and the prosodist (in terms of scansion and according to the practice of each nation). The rhymist considers rhyme³⁶.

The poetic discourse is imaginative because imagination is able to combine images. This capacity is indispensable for our mental acts, from the mere act of thinking to acts of recalling and even dreaming. Poets combine images voluntarily thanks to the compositive imagination; thanks to the estimative power, those images can be loaded with "emotive meanings"³⁷. The capacity of imagination to "bring to mind" images

35. This would be a especial capacity of the estimative power in human beings, since animals are not capable of composing figurative language even though they also have imagination and estimative power. It seems then that the creation of figurative language involves in some way certain intellectual capacities. In this sense, the creation of figurative language or the creation of metaphors are part of a logical process, even a syllogistic one. This is why Avicenna had conceived a poetic or imaginative syllogism; see KEMAL, (1991) and (2003); BLACK, (1990). Commenting *Poetics* 21, Avicenna refers to metaphors as the transfer of a name based on resemblance, and writes in AVICENNA, *Al-Šifā, Kitāb al-shi'r* VII, 3: "The transfer is applying to a name with a given sense the sense of another, but not to the extent that the one becomes the name of the other and the distinction is lost between the first and the second. The transfer is sometimes from genus to species, or from species to genus, or from species to species, or the analogous of a thing is transferred from its like in relation to a fourth, as when old age is called the evening of life or the autumn of life". Apparently, Avicenna holds a tensional view of metaphors, quite close to the Aristotelian, but also quite close to the metaphoric interactionism of contemporary thinkers such as Max Black or Paul Ricoeur. Avicenna speaks of transfer of terms, but not of substitution of meaning. Making metaphors is an act that cannot put our reasoning capacity aside.

36. AVICENNA, *Šifā, Kitāb al-shi'r*, I, 1.

37. In this emotive element lies the persuasive force of poetry, see AVICENNA, *Al-Šifā, Kitāb al-shi'r*, I, 3: "If the imitation (*muhākā*) of a thing which is untrue moves the soul, then it is no surprise that the depiction of a true thing as such moves the soul, too. The latter is even

loaded with meanings beyond sensible objects translated into intentions (or emotions), allows Avicenna to conclude that the estimative power is decisively linked with our thought and our judgments. And thanks to it, both assent and conviction can be caused by means of imagination:

Both imaginative assent and conviction are [kinds of] compliance. Imaginative assent, however, is a compliance due to the wonder and the pleasure caused by the utterance itself, while conviction is a compliance due to the realization that the thing is what it is said to be. Imaginative assent results from the utterance itself, conviction from what is spoken of, i.e., the focus is on the matter being conveyed³⁸.

The preceding passage implies that we can be convinced of something because it has been presented to us through agreeable images and, therefore, we can accept or reject something without considering, reasoning or choosing. Hence, the logician knows that in the poetic discourse demonstrative syllogisms should not be used, since the soul is more inclined to an object through imaginative representations. Avicenna mentions that although the logician is concerned with this logic-discursive dimension of poetry, the musicologist is concerned with measure. That is why we have the definition of music presented by Avicenna in his *Jawāmi' 'ilm el-mūsīqā*:

Music is a mathematical science the aim of which is the study of musical notes; it examines its consonance and dissonance, as well as its duration and thus, how is it that the rules of musical composition are set. Music, then, comprises two branches: the first, which refers to the notes, is denominated "sciences of melodic composition;" the second concerns the time that separates the notes of a melody and is denominated "rhythmic". At the base of these two sciences are found the principles obtained from sciences not related to music. Some of them are arithmetical, others are physical taken from the Natural Sciences, and some others are, so to say, geometrical. The existence of physical principles in music is due to the physical contents of this art. [However,] if we are to explain precisely and through strong principles the affairs related with music, we cannot do so by just recurring to physical principles. The mathematical principles that formally [compose] music are too material to understand this art, just as it has been seen in *The Book of Demonstration*. In this way, in fact, music

more necessary. But human beings are more amenable to imaginative (*tajyīl*) representation than to conviction; and many of them, when hearing the demonstrable truths, respond with aversion and dissociation. Imitation has an element of wonder (*ta'yīb*) that truth lacks".

38. AVICENNA, *Šifā, Kitāb al-shi'r*, I, 4.

receives the numerical relations through which it appears as harmonic or as being out of tune³⁹.

Music has principles, rules and objective forms of composition that guarantee the objectivity of harmony. I will not treat these, since it would demand an extremely technical approach to the forms of musical composition, which, by the way, can actually be found in Avicenna's treatise. What I want to point out is that in the last passage, Avicenna has clearly expressed that music has a numerical structure; and this structure is grasped, precisely, thanks to the estimative power. (It is not necessary to make a conversion from musical notes to numerical signs to appreciate music). But it is not only numerical relations that we grasp in it. In that combination and succession of notes we find something pleasant that we can associate with an emotion. The next passage turns out to be especially important, since Avicenna suggests in it that all our internal faculties are involved in musical perception, particularly, imagination. The latter is what allows us to discern succession and combination from sound:

The considered law is that melody and rhythm are perceptible. This perceptibility depends on the way in which the melodies and rhythms impress the imagination and the way in which the overall composition is presented to it. A composition is agreeable when its elements constitute a whole. Such unity could not exist in sensation (*ḥasn*), since one could not feel at the same time two consecutive notes; but its impressions persist in imagination, and there they group together; it is then that, first, everything takes unity in the imagination and, afterwards, beauty is searched in that unity. If a second note or a second percussion took place when the imprint of the first one has been already erased, there could be no unity and any impression of the composition would have been eliminated. Therefore, something new must be perceived when the imprint of the other is still in the imagination, so it seems that they were perceived at the same time. This happens at the end of the rhythm of the percussions that are separated by too much time, but imagination retains the memory when it proceeds as we have pointed out. Thus, the rhythmic percussion of drums accompanies the final stages of many melodies. But here we do not talk of the tempi that separate the percussions of this genre, but of the tempo preserved in imagination when it is summed, after the imprint of the first percussion, a second lacking any intermediate percussion or any other reminder of it⁴⁰.

39. AVICENNA, *Jawāmi* 'ilm el-mūsīqā I, 2: 9, 10.

40. AVICENNA, *Jawāmi* 'ilm el-mūsīqā V, 1: 90, 10.

III. MUSICAL PERCEPTION AND MUSICAL THINKING

The differences between sound and hearing and between sound and music described above, lead to an explanation of how sounds are related through the internal perceptive faculties. Avicenna affirms that sound is one of those qualities that we can perceive through our senses. The ear can listen to sounds, but cannot perceive them as something delectable or detestable. In this regard, there is an important difference between Aristotle and Avicenna. In *De anima* III 7, 431a8-14 Aristotle affirms that external senses perceive what is agreeable and disagreeable in sensations and, therefore, that 'information' is already conveyed by them to common sense and the imagination. Avicenna, instead, understands that the only things external senses are able to grasp are proper and common sensibles, but not experiences of pleasure and displeasure. That is why the intervention of the estimative power is required.

Avicenna's stance allows us to construct a theory of aesthetic perception: the pleasure and displeasure we experience towards a color, an aroma or a sound would not come from external sensation but from the internal perceptive faculties. In this way, even when there are external objective properties that trigger our aesthetic experiences, the mind has an extremely active role. In this sense, the role of the internal senses is essential to explain the overall aesthetic experience and, obviously, musical perception. Within aesthetic perception, the estimative power plays a fundamental role. At the same time, the role of the estimative power must be understood according to the levels of abstraction that Avicenna sets forth in his epistemology as well as in his metaphysics.

According to the explanation in Avicenna, *Kitāb an-Najāt*, 38-40, Avicenna places the most basic degree of abstraction (*ta'yrid*) within sensible perception. In fact, when we perceive the form of an object (*ṣūrat al-mudrak*), we perceive a sensorial stimulus which is yet corporeal and, therefore, limited. But in a second moment, the retentive imagination (*al-jayāl/al-mutaṣawwira*) manages to make those forms remain so that the compositive imagination (*mutaḥayyilah*) composes and recombines the retained images. We could certainly situate artistic creation in this level (in our case, musical creation). Avicenna describes a series of mental processes or operations that enables the production of new forms and images and, in our case, of combinations and successions of sounds from which we can compose harmonic melodies. However, in this level, Avicenna would not be referring to some kind of 'intuitive capacity', but to a particular capacity that can take place because there are certain mental

operations, though they are not yet conceptual. For this reason, at the level of musical creation, the mind is capable of ordering a series of 'imaginary' sounds regulated from the superior intellectual faculties⁴¹.

A third degree of abstraction, namely that which is possible thanks to the estimative power, explains how musical perception can take place. In fact, the estimative power, as I have already suggested, enables us to recognize connotational attributes not grasped by the senses, but ungraspable if not present in a material medium:

The faculty of estimation goes a little farther than this [i.e., the representation degree] in abstraction, for it receives the intentions which in themselves are non-material, although they accidentally happen to be in matter. This is because shape, color, position, etc., are attributes which cannot be found except in bodily matters, but good and evil, agreeable and disagreeable, etc., are in themselves non-material entities and their presence in matter is accidental. The proof of their being non-material is this: If it were of their essence to be material, then good and evil, agreeable and disagreeable would be inconceivable as accidents in a physical body. Nevertheless, sometimes they are conceived in themselves apart from matter. It is clear that in themselves they are non-material and their being in matter is entirely by accident. It is such entities which the faculty of estimation perceives; and thus it perceives non-material objects which it abstracts from matter⁴².

The pleasure caused by the agreement (*muwāfiq*) of musical sounds, i.e. harmony, would be then a connotational attribute. We can recognize it and delight in it. This is why the estimative power plays a leading role in musical perception and even in every aesthetic experience. Artistic beauty would be, in this sense, a non-reducible experience to the first degree of abstraction, i.e. the external sensible perception. But now another problem

41. This means that there are some cognitive acts in which the internal senses interact with intellectual faculties. I think that in musical creation, where even imagination and the estimative power play a relevant role, the cogitative power intervenes too. For this reason, Avicenna does not have a mere sensitive conception of music and he is also aware of music's precise formal structure that easily surpasses mere 'auditory imagination'. Hence, within his *Jawāmi* 'ilm el-mūsīqā we can find extremely technical musical aspects: the numeric ratio of consonance, the explanation of intervals and its mathematical justification; remarks on the musical semi-phrase, rhythmic and melodic structures and many other technical terms. It is clear that in order to appreciate music it is not necessary to know all these aspects. The composer, however, does require them: musical composition requires imagination, but also a faculty closely related to the intellect, i.e. the cogitative power.

42. AVICENNA, *Kitāb an-Najāt*, 39-40.

arises: If the estimative power is the highest faculty of animals, can they recognize musical intentions?

Animals cannot create music since, as I have said, they cannot order sound, because they lack the interaction of the imagination with other intellectual faculties. Nevertheless, it seems that animals actually grasp consonance, harmony, and rhythm. Music, in this sense, is agreeable to animals. Avicenna, like al-Kindī before him, even admits that melodies can generate emotional effects in animated beings⁴³. However, the fact that animals can perceive music does not imply that they can reach an aesthetic experience resembling that of humans. Animals might recognize harmony, but they cannot associate it with beauty. In order to do that, according to Avicenna, they would require another degree of abstraction, one that surpasses sensible perception, imagination and the estimative power, namely, intellection. Avicenna says:

All convenient beauty and all good perceived is loved and desired, being the principle of its perception in the senses (*ḥiss*), the imagination (*jayāl*), the estimative power (*wahm*), opinion (*ẓann*) and the intellect (*ʿaql*)⁴⁴.

It is necessary to distinguish between the aesthetic perception found within the scope of external and internal perception from the appreciation of beauty. We share the former with animals because it is a purely sensorial perception. In this sense, it is relevant to emphasize the material conditions of this kind of perception. In fact, aesthetic perception, as any other sensorial perception, necessarily requires corporeal organs:

43. In fact, just as SHEHADI reminds us (1995, 27-31), in al-Kindī's *Musawwītāt* there are some observations that allow us to verify how the philosopher was convinced of the effects of music in the animal kingdom. Al-Kindī says, for example, that the sound of flutes attracts dolphins and whales; that fishes like the notes of the laud; and that before string instruments peacocks spread their tails. Al-Kindī mentions how according to their races, some persons reject some instruments: Persians reject the organ and the gong; Hindus and Romans reject the sound of the long-necked laud of Kuhrāsān. From these typologies, al-Kindī composes his "musical therapy". There are different kinds of melodies and each one induces different emotional effects (whether positive, like it might happen with melodies that put us in a good mood, or negative, like it might happen with those melodies that annoy us). The philosopher of music would be then in suitable condition to give musical therapy. Just as there are different eating habits according to races and nationalities, and the physician can heal certain conditions by applying dietetics, the philosopher – or the musicologist – could make of music a remedy for some diseases. Avicenna, actually, resorted to music in his medical practices and even managed to establish certain relations between music and pulse. AVICENNA, *Qānūn*, 12.3.9, §111, 291-292.

44. AVICENNA, *Kitāb an-Najāt*, 282, the translation is mine.

All perception of the particular is through a bodily organ. As for the faculty which perceives individual forms, for instance, the external senses which perceive them in a way not completely divested of or abstracted from matter and not at all divorced from material attachments, the question of such a faculty is quite easy and clear. This is because these forms are perceptible only so long as their matter is present and a body can be present only to another body; it cannot be present to what is incorporeal. It has no relation whatever of presence and absence to an immaterial faculty, for a thing in space cannot have a relation of presence and absence to anything non-spatial. [...]

And as for the faculty which perceives the individual forms as completely abstracted from matter but not at all abstracted from material attachments, like representation, it also needs a physical organ. For the faculty of representation cannot perceive without the represented forms being imprinted on a body in such a way that both it and the body share the same imprint⁴⁵.

The internal senses are, in fact, situated in the brain. In Avicenna's opinion, the *sensus communis* is located in the forepart of the front ventricle of the brain; the retentive imagination is located in the rear part of the front ventricle of the brain; the compositive imagination is located in the middle ventricle of the brain; the estimative is located in the far end of the middle ventricle of the brain; and memory is located in the rear ventricle of the brain⁴⁶. The organic dependence both of external and internal senses makes it impossible for universal concepts to be grasped through them⁴⁷. In fact, the knowledge we have at the perceptive level, both external and internal, is precisely non-conceptual knowledge.

Naturally, only the rational soul is capable of reaching the highest degree of abstraction, the universal degree. But it cannot make it without the assistance of animal faculties. It is clear that the appearance of the functions of the soul, according to Aristotle and Avicenna, is gradual. In this sense, the animal soul, characterized by motion and perception, also includes the functions of the vegetative soul, while the rational soul supposes the vegetative and animal functions. This gradation found in the Aristotelian psychology, is useful for distinguishing between the properly aesthetic perception (in our case, the pleasure produced by musical harmony), and the appreciation of beauty that, in Avicenna's case, would require a higher function than the perceptive one. It becomes clear that in

45. AVICENNA, *Kitāb an-Najāt*, 41.

46. AVICENNA, *Kitāb an-Najāt*, 31.

47. AVICENNA, *Kitāb an-Najāt*, 41.

the passage quoted above⁴⁸, where Avicenna talks of beauty appreciation, he integrates the senses, the imagination, the estimative power, opinion⁴⁹ and the intellect.

The appreciation of beauty is possible only for the rational soul (*al-naḥs al-nāṭiqā*). The rational soul possesses two faculties, a theoretical (*naẓariyya*) and a practical (*ʿamaliyya*) one. The practical faculty guides ethics and all the practical arts and, in this sense, it would be responsible for artistic creation, since in the latter all our different faculties interact with the intelligence and with the purpose of creating. On the other hand, the perception of beauty is guided by the theoretical part of the rational soul. A passage of the *Kitāb an-Najāt* informs us of Avicenna's conception of the metaphysics of beauty:

In the Necessary Being we find the highest degree of beauty (*ḡamāl*), of perfection and splendor. He understands His own essence in the highest degree of splendor and beauty. In His intellection, there is achieved a unity of the one who understands and what He understands⁵⁰.

It is beyond the parameters of this study to go deeply into Avicenna's conception of metaphysical beauty. It is enough to point out that it is not accessed by means of sensible perception. Avicenna is thinking of the highest degree of separation. That ascending way would lead to the metaphysics of the *Ṣifā*, to the *Ilāhiyyāt*. This would require another study, one with a focus on beauty rather than on musical perception.

CONCLUSION

I think that in his work dedicated to music, Avicenna offers a series of observations that are relevant for the theory of perception. We have seen how his disquisitions presuppose a physical description of hearing. Although the proper object of hearing is sound, music is a kind of meaningful sound characterized by harmony, intervals, and rhythm. The conjunction of those elements accounts for the pleasure humans find in melodies. In fact, Avicenna explains that the pleasure derived from the

48. AVICENNA, *Kitāb an-Najāt*, 282.

49. Opinion (*ẓann*) would be listed here, perhaps, because it would intervene in the process of judging what is pleasant and unpleasant and in the reactions of attraction and rejection of what is presented to us in an attractive or reprehensible way; see AVICENNA, *an-Najāt*, trans. F. Rahman, 26.

50. AVICENNA, *Kitāb an-Najāt*, 252, the translation is mine.

consonances surpasses the scope of purely sensorial hearing and does force us to understand the phenomenon of musical creation and its appreciation on the basis of the activity of our internal faculties. I have described the leading role of the compositive imagination and the estimative power. In this sense, I believe it is clear that musical perception demonstrates that our internal perceptive faculties play a fundamental role in cognitive acts. The case of music seems exemplary to me since in it our perceptive faculties are able to interact and recognize numerical harmonies, affective qualities, consonances and dissonances that are in fact connotational attributes. In my view, musical appreciation cannot be explained based on mere sensation. But it is not explained by intellection either: musical perception is not conceptual. In it, the imagination and the estimative power lay a bridge between sensation and intellection of beauty.

Musical acts allow us to establish resemblances and differences between animal and human perception. Since we share our perceptive faculties with animals, they can grasp musical harmony too. Actually, certain melodies would please animals too and would engender in them certain emotions. However, although animals can perceive music, they cannot compose nor appreciate it. Musical composition demands certain intellectual capacities that enable humans to articulate harmonic sounds voluntarily. Animals, on the other hand, can recognize the intentions that accompany music, but according to Avicenna, they cannot appreciate music as something beautiful. The perception of beauty is possible only at the highest level of abstraction and in this sense it is a metaphysical experience.

BIBLIOGRAPHY

Sources

- AL-FĀRĀBĪ (2001), *Grand traité de la musique*, trad. R. Erlanger, *La Musique Arabe*, t. 2, Société Nouvelle Librairie Orientaliste Paul Geuthner (reproduction de l'édition de 1935), Paris.
- AL-KINDĪ (1962), *al-Musawwītāt al-watariyyah*, *Mu'allafāt al-Kindī*, ed. Zakariyyah Yousef, Bagdad.
- AL-NADĪM, ibn (1998), *The Fihrist*, trans. B. Dodge, Columbia University Press, New York.
- ARISTOTLE (2000), *On the Soul*, trans. W. S. Hett, Loeb Classical Library, London.

- (1995), *The Complete Works of Aristotle (On the Heavens, History of animals, Parts of animals, On Things Heard)*, ed. Jonathan Barnes, vol. 1, Princeton University Press, Princeton.
- (1995), *The Complete Works of Aristotle (Metaphysics)*, Jonathan Barnes (ed.), vol. 2, Princeton University Press, Princeton.
- AVICENNA (1952), *Avicenna's Psychology*, trans. F. Rahman, Oxford University Press, London.
- (1956), *al-Šifā'* (Mathématiques. 3. Musique (*Jawāmi' 'ilm el-mūsīqā*), ed. Zakariyya Yousef, Imprimerie Nationale, Cairo.
- (1959), *Avicenna's De anima, being the Psychological Part of Kitāb al-Shifā'*, ed. F. Rahman, Oxford University Press, London.
- (1974), *Commentary on the Poetics of Aristotle*, trans. Ismail M. Dahiyat, Brill, Leiden.
- (1985), *Kitāb al-Najāt*, ed. Majid Fakhry, Dar al-'Afaq al-Jadidah, Beirut.
- (1999), *The Canon of Medicine (al-Qānūn fī l-ṭibb)*, adapted by Laleh Bakhtiar, O. Cameron Gruner and Mazar H. Shah (trans.), Great Books of the Islamic World Inc., Chicago.
- (2001), *Mathématiques, Kitābu' š-šifā'*, trad. R. Erlanger, *La Musique Arabe*, t. 2, Société Nouvelle Librairie Orientaliste Paul Geuthner (reproduction de l'édition de 1935), Paris.
- (2007), "Sections on Psychology from *The Cure*", in McGinnis, J., Resiman, D. (trans., eds.), *Classical Arabic Philosophy. An Anthology of Sources*, Hackett Publishing Company Inc., Indianapolis/Cambridge.
- MICHAEL SCOTUS (1992), *De animalibus: Michael Scot's Arabic-Latin translation. Part three, books xv-xix Generation of animals*, ed. Van Oppenraaij, Brill, Leiden.
- (1998), *De animalibus: Michael Scot's Arabic-Latin translation. Part two, books xi-xiv: parts of animals*, ed. Van Oppenraaij, Brill, Leiden.

Studies

- BLACK, Deborah (1990), *Logic and Aristotle's Rhetoric and Poetics in Medieval Arabic philosophy*, Brill, Leiden.
- (1993), "Estimation (Wahm) in Avicenna: The Logical and Psychological Dimensions", in *Dialogue* xxxii, 212-258.
- (1997), "Avicenna on the Ontological and Epistemic Status of Fictional Beings" in *Documenti e Studi sulla Tradizione Filosofica Medievale* 8, 425-453.
- (2000), "Imagination and Estimation: Arabic Paradigms and Western Transformations", in *Topoi* 19, 59-75 (Kluwer Academic Publishers: Printed in the Netherlands).
- CRUZ HERNÁNDEZ, Miguel (1981), "La teoría musical de Ibn Sina en el *Kitāb al-Shifā'*", en *Milenario de Avicenna*, Instituto Hispano-Árabe de Cultura, Madrid, 26-36.
- DAVIDSON, Herbert (1992), *Alfarabi, Avicenna and Averroes on Intellect*, Oxford.

- FARMER, Henry G. A. (1925), "Clues for the Arabian Influence on European Music", in *Journal of the Royal Asiatic Society*, 61-80.
- (1930), "Greek Theorists in Arabic Translations", in *Isis*, vol. 13, núm. 2, 325-333.
- (1931), "Music", *The Legacy of Islam*, Oxford University Press, London.
- (1932), "The Influence of al-Fārābī's 'Ihsa al-'Ulum' (*De scientiis*) on the Writers on Music in Western Europe", in *Journal for Royal Asiatic Studies*, 561-592.
- (1959-61), "Tenth-Century Arabic Books on Music", in *The Annual of Leeds Universal Oriental Society* II, 37-47.
- GUTAS, Dimitri (2001), "Intuition and Thinking: The Evolving Structure of Avicenna's Epistemology", in *Aspects of Avicenna*, ed. Robert Wisnovsky, Princeton, 1-38.
- HASSE, Dag Nikolaus (2000), *Avicenna's De anima in the Latin West*, London/Turin.
- KEMAL, Salim (1991), *The poetics of Alfarabi and Avicenna*, Brill, Leiden.
- (2003), *The Philosophical Poetics of Alfarabi, Avicenna and Averroës*, Routledge Curzon, London.
- PETERS, F. E. (1968), *Aristoteles Arabus*, Brill, Leiden.
- RANDEL, Don M. (1976), "al-Fārābī and the Role of Arabic Music Theory in the Latin Middle Ages", in *Journal of American Musicological Society* 2, 173-188.
- SHEHADI, F. (1995), *Philosophies of Music in Medieval Islam*, Brill, Leiden.
- WINGATE, S. D. (1931), *The Mediaeval Latin Versions of the Aristotelian Scientific Corpus, with Special Reference to the Biological Works*, The Courier Press, London.
- WINNINGTON-INGRAM, R. P. (1932), "Aristoxenus and the Intervals of Greek Music", in *The Classical Quarterly*, Vol. 26, N. 3/4, 195-208.