Music for Pleasure

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1.1 Some Narrative Reflections

What is music? And more importantly, what cultural value does music have?

Why are human beings musical?

And again, does music have a moral significance?

The definition of music in the Encyclopedia Britannica can serve us as a start: "… art concerned with combining vocal or instrumental sounds for beauty or form of emotional expression, usually according to cultural standards of rhythm, melody, and in most Western music, harmony" [1].

We see how with time the meaning of music has conceptually evolved comparing the above definition with Rousseau's in his 1767 *Dictionnaire de musique*: "… art of combining sound in a way pleasant to the ear" [2].

Rousseau's "sounds" become "vocal or musical sounds" and their combination is not anymore only pleasant to the ear but also an expression of "beauty" and of emotional activity related to perceptions that rely on the culture of the musician and the listener. There is an opening to timbre, rhythms, and sound juxtapositions, not necessarily homogeneous or defined by absolute "pleasantness" if not linked to the cultural context they are created in.

This modernization in the conception of music is due to the anthropological revolution started in the twentieth century, originating from constant and fruitful ethnomusical research.

World music scholars confirm that in all societies, no matter how small or isolated, symbolic productions carried out through sound can be found. Thus, resorting to musical expression is universal to the humankind, as language is. Just as different languages exist, there are very numerous ways of arranging sounds and musical

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creations that are directly linked to their own cultural roots and the societies they have developed, layered, and evolved in.

However, music is an art with fluid boundaries. Let's think of the very idea of art: a human activity conducted and designed to create symbols or an activity aimed at enhancing an aesthetic purpose, to this effect dependent on judgments on its value, the taste of its time, or cultural uniformity?

Undoubtedly, shifts in art scenery in general are the result of the evolution of time. Throughout art history, renewal is continuous and the need to always create something new and original is relentless. Look at the progression we perceive when admiring Leonardo's *Mona Lisa*, Picasso's *Les demoiselles d'Avignon*, and Jackson Pollock's artwork. The evident changes are radical: the move from a figurative representation to a more expressive one, the freedom from conventions of perspective or verism, the use of vivid and contrasting colors, the artist's gestural and almost shamanic dimension in the making of the artwork. Nevertheless, all these works of art are readable. Also in Mondrian or Leger, we are able to recognize known geometrical shapes and colors, and in Pollock we can visualize his gesture and movement, the dramatic action, and corporality.

Applying these reflections to music, it is not difficult to see similar contrasts between a "canonically classical" piece of music as, for example, Handel's *Water Music,* and Debussy's piano *Preludes*, Stravinsky's *Sacre du Printemps*, or Xeneakis' *Pleiades*.

Debussy initiated the first big change in the twentieth century. He creates a language where musical writing is fragmented and sonority becomes a cornerstone parameter as important as harmony and rhythm. "Conceive otherwise" is how Debussy thinks of his compositions. The initial phrase of *Prelude à l'apres midi d'un faune* of 1894 is expressed without harmonic support, with a small tonal interval (triton) that then leans on seventh chords. The structures appear veiled, like arabesques, and correspondences between notes are revealed as open, not encumbered by any preconstructed direction.

Stravinsky composed his ballet *Sacre du Printemps* in the winter at the turn of 1912 and 1913, based on a vision of a sacrificial rite. A group of old wise men were reunited in a circle and watched a young girl dancing to exhaustion and death, a sacrifice to ingratiate the god of Spring. The first performance in Paris in May 1913 caused a great scandal and fierce protests from the audience that rebelled against such a new and violent music. But that score, with a duration of 35 min, emblematically marked the avant-garde of those years. It turned upside down all hitherto regarded canons of taste and beauty. The primitivity, the simplification of melodic lines in connection with the complexity of rhythmic structures, the obsessive, almost percussive orchestration, and finally the overlapping of consonances and dissonances make this ballet the obligatory step between figurative and expressionist in music. For Stravinsky, modernity is in the technique of composition, in the form itself, in the symbolism that recalls archaic and earthbound values.

In the field of music, the beginning of the twentieth century has hence led to the search for new harmonic connections, different timbres, and increasingly bold constructions able to carry out a sometimes radical opposition to established canons. In

this context, atonality develops, a definitive contraposition to the major–minor tonal system and an expression of the cultural crisis of contemporary society.

Following this, only some years later, Stravinsky was accused of belonging to the past. In his *Philosophy of Modern Music*, Theodor Adorno marks him as representative of conservatism (Stravinsky and Restoration). At the opposite pole, Adorno places Arnold Schoenberg, the creator of the 12-tone technique, whom he describes as progressive (Schoenberg and Progress) [3] (Box 1.1).

In the last years of his life and his career, Stravinsky himself moved closer to this music with some complex works written in a 12-tone musical key, such as the ballet *Agon*. He thus embraces the new avant-garde, which will then move still further, as we can see from the elements and substance of contemporary music of the twentieth century.

Iannis Xenakis, for instance, forges a musical poetics seeking an "objective" noise of the world, a musical pattern as similar as possible to the sound of nature [4]. For Xenakis, "music has to be taken out of the atrophied glasshouses of tradition and brought back to nature." His compositions are often for percussion instruments, thus supporting the need for strong sound and rhythm. Listening to them means interpreting a notation based on the formal language of mathematical formulas of complex theories of randomness such as stochastic process, fluid mechanics, and statistical laws.

Still, in all of this music, we always hear contrasts, crescendos, ruptures, inversions, developments, progresses, and conclusions, which enable us to find a listening orientation in a composition, even when they refer to a language we are not always familiar with.

Photo: "Switching on Xenakis," courtesy of Lorenzo Colombo

John Cage corroborates a concept of music as aleatoric geometry (and how not to think of Mondrian's painting here): "If this word, music, is sacred and reserved for eighteenth- and nineteenth-century instruments, we can substitute a more meaningful term: organization of sound" [5]. But is it sound? In August 1952, the score of 4′33″ is first performed. The pianist sits at the piano, he clocks the times (30″, 2′23″ 1′40″), opens and closes the lid of the keyboard in correspondence, never touching a key. The score indicates "tacet." But is it music or silence? Or maybe silence doesn't exist: in those 4′33″ the listeners can maybe hear their hearts beating, a chair creaking, noises from the surroundings. The silence, which John Cage defines as "true, positive, active, affirmative… we were there before but we just weren't aware" [6]. For Cage, sounds must be just what they are and to listen means to open oneself to the totality and complexity of that which exists, without any kind of intent. Silence potentially contains all sounds. It is open to any possibility, up to the edge of uncertainty. Chance and the listener are in charge of filling the void and, thanks to silence, the multiplicity of noises find their way into the music. Is then 4′33″ a musical work or the art of contemplating time, life, and unpredictability?

However, all this change is the result of the knowledge and study of non-western cultures. As early as 1885, Ellis was pointing out that musical scales can be very diverse in different cultures and concluded that "The musical scale is not one, not "natural," not even founded necessarily on the laws of the constitution of musical sound so beautifully worked out by Helmholtz…" [7] (Box 1.2).

Photo: "A prepared piano," courtesy of Alexander Banck-Petersen

The impact this anthropological engagement had on the dominant musical culture was disrupting: western musical language is in crises. The introduction of atonality, of 12-tone scale and of a way of composing able to overcome formally

constructed shapes and structures expressed the acceptance of a new concept that shows what music can be: a form of expression and of language that can be found in any culture and based on specific means of organizing sound. A form of expression is not required to necessarily follow canons of beauty or pleasantness but is expected to be coherently appropriate to its mission and purpose. In this regard, the final aesthetic is only one, but not the only one, of the critical qualities of an artistic process as symbolic as music.

Music can effectively be described as the whole of the forms and practices that a society or culture considers eligible to create an organized sound, according to its own criteria. In some African cultures, for example, it is at times difficult to distinguish between music and dance, and this can be reflected in the lack of a specific terminology. The word "kwina" used by the Kamba in Kenia, for instance, means to sing as well as to dance. On the other hand, the Somali people have three different words: "heesid" for singing songs, "ciyaarid" for sound accompanying dance, and "gabyid" for singing poetry. In the Inuit language, the word "nipi" means music, but also noise and even the sound of a speaking voice. The distinction between sound and noise made by the Basonge of Central Africa is also interesting: "when you are merry you sing, when you are angry you make noise … singing is peaceful, noise isn't" [8]. In ethnomusical and cultural terms, all this leads to an interpretation and to the conferring of musicality to sound. In the intentional act of producing a desired sound lies its musicality. This means having an organized or extrapolated plan related to a musical action with specific and linked functions such as having techniques in the phonic use of voice, having objects designed for producing organized sound, assigning a defined temporality to the sound produced. Notably, in this last definition, we can find a feature peculiar to music: music is intangible, immaterial, and incorporeal but can become concrete precisely and exclusively thanks to its specific temporality, made of rhythms, lengths, and silences inserted in the "present time," becoming however a "virtual time." As Levi-Strauss said, "music is a machine to abolish time" [9].

Box 1.1

Traditional references to tonality are revolutionized by Arnold Schoenberg in 1909 with his absolutely atonal composition *Three Piano Pieces, Op. 11*. "I aspire to a complete liberation from all symbols of coherence and logic" he said, "no more harmony seen as an architectural building block … harmony is an expression and nothing else" [10]. Later, in 1929, Schoenberg invented and applied the so-called "serial" technique to various compositions for piano (Opp. 23, 24, and 25). The 12-tone structure is based on a series of sounds, mostly 12, linked to one another according to a definite order, with the chromatic scale as its starting point. The principle this system is based on is that the same note must not reoccur before all other 12 notes have been played. The harmonic rules' tonality had accustomed us to have vanished, and traditional reference points are now overcome. The composer doesn't feel the need to take into account the audience's expectations. What is created is bound to

new writing procedures that don't necessarily have to be understood. Music thus enters an age of individuality but, at the same time, doesn't resolve itself in the stability of a new musical language. The 12-tone technique is a new paradigm, but not unalterable. It has nevertheless prompted an urge toward new approaches to composing born from and defined by reaction and contradiction (electroacoustic music, electronic music, concrete music, postmodern music). Music has followed the ways and the spirit of the time, the "Zeitgeist." Writing music has always strived toward constantly more open directions, depending on the methods of the immediate predecessors and the new technological means available.

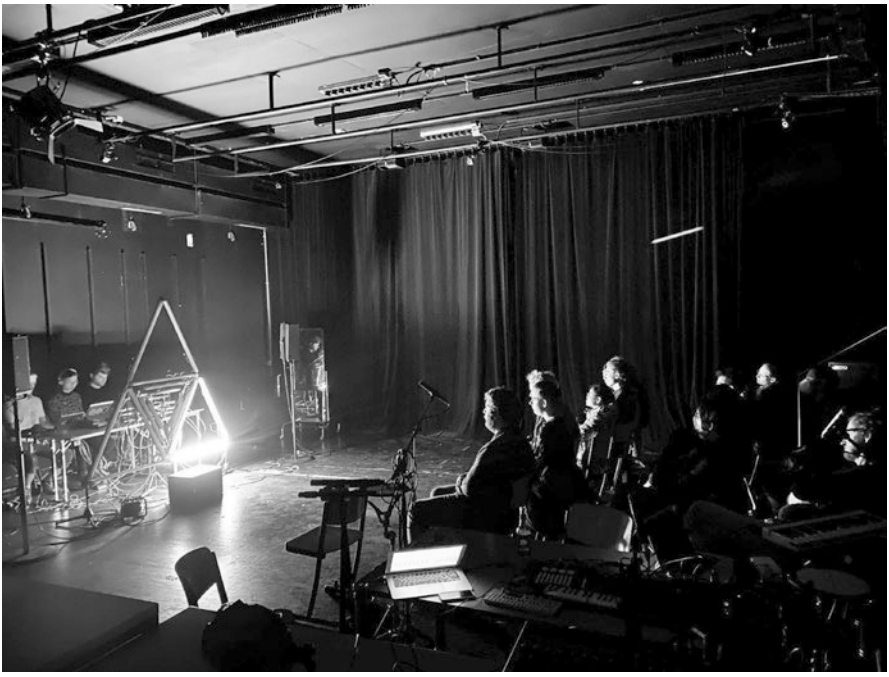

Photo: "Sound and visions," courtesy of Alexander Schubert

Box 1.2

According to an evolutionist concept, over time, musical language has followed a path that has gone from ditonic scales to the heptatonic scale, where it has found its final stability. From here evolution would have coincided with the development of natural resonance: from the seventh of Renaissance music to the eleventh of Debussy and then to the twelfth of Messiaen. But, with the

appearance of new expressive means, e.g., the use of electroacoustic instruments, natural resonance laws are undermined, and the concept of music expands. It is not only rhythm or pitch anymore, it is a sonic entity and sometimes noise. Aesthetics and listening attitudes necessarily have to change, hand in hand with the cultural and historical climate they have emerged from.

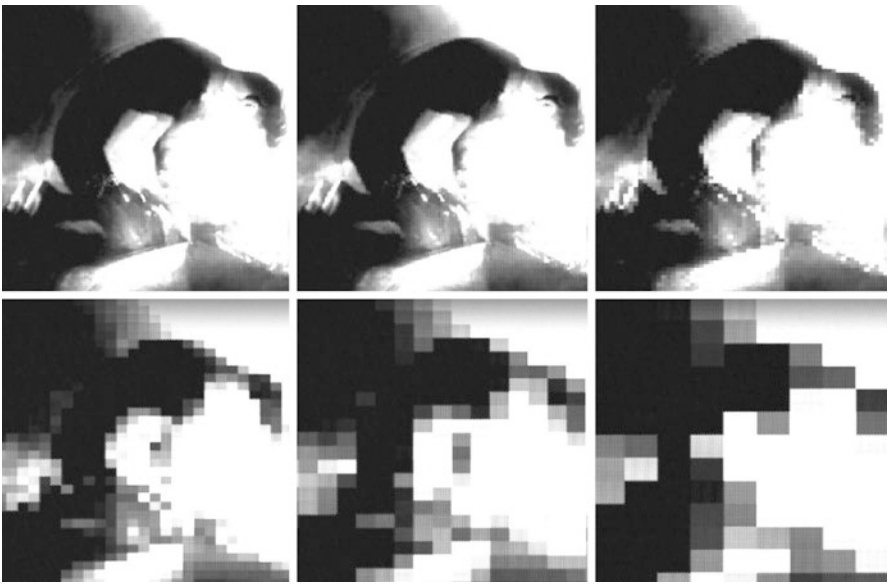

Photo: "Deconstructing sounds," courtesy of Lorenzo Colombo

1.2 The Shape of Music

The word "music" originally referred to the Muses and their art. It didn't have a specific meaning, but denoted all sorts of activities inspired by pleasure, well-being, and beauty. In mythology, the Muses were the nine daughters of Mnemosyne (that is Memory) and Zeus. They each had specific skills around thought (eloquence, persuasion) and singing in all its forms. Greek mythology tells about a very strong connection and an elective affinity between mind and music, thought and singing, and memories and melody. Moreover, the word "muse" could derive from an Indo-Germanic root "ma(n)," which means knowledge and thought: similar to the Italian word "mente", the Latin "mens" and the Sanskrit "manas" and the English word "mind". Clearly, music has always been recognized as a noble art, capable of putting in communication and in relation mind, spirit, and emotions.

In ancient times, music was seen as a way of redeeming: Pythagoras and his disciples used medicine to purify the body and music to achieve the same goal, but

for the soul. According to the Pythagoreans, the universe followed the same rules that regulated the world of sound, and this was a sign that the essence of music was pure and ascetical. Furthermore, still in the Pythagorean school, it was recognized that pleasant sounds (consonant) were produced when the frequencies of two vibrating entities formed simple integer ratios (i.e., 2:1, the octave). On the contrary, complex ratios produced rough sounding tones (i.e., 16:15, dissonant minor second). The concept of musical purity resonates in the last century as well. One needs only think of what Jean Cocteau wrote in 1918 in *Le Coq et l'Arlequin*, taking as a point of reference for pure music the whole of Satie's work, followed by Webern's figurations and the 12-tone serialism [11]. These require a search for abstraction that is formal and rigorous and so also pure. Nevertheless, one can often perceive in the listener of such scores, a feeling of bewilderment and incomprehension. The atonal and often dissonant codex seems full of impurities and is not only difficult to approach but also a source of anguish and awkwardness, unpleasantness, and instability. For this reason, consonant pitch relationships occur more frequently in tonal music than in dissonant relationships. Moreover, a preference for consonance is observed early in life, well before an infant is exposed to culturally specific music. Does then tonal harmony have foundations?

Does our brain search for musical purity or is it already designed to discriminate between harmony (purity) and dissonance/atonality (impurity)? Classical neurophysiological studies have enabled us to compare the perception of consonant intervals (relationships of frequency that can be simple as octave, fifth, fourth, and major third, or complex as major seventh or dissonant as minor second or tritone) using the scalp-recorded frequency-following response (FRR), assuming that phase-locked neural activity within the brainstem may preserve information about consonant and dissonant pitch relationships. The results of these experiments confirm this fascinating idea: the strength of aggregate neural activity within the brainstem appears to be correlated with the relative ordering of consonance found behaviorally. Furthermore, basic properties of musical pitch structure are encoded both in subjects classified as non-musician and without musical ear training, and possessors of an absolute/perfect pitch. Intervals elicit graded levels of pitch salience and lead to different subjective ratings, accounting for the hierarchical ranking of musical intervals. This study confirms that the subcortical response to consonant pitch intervals generates more robust and synchronous phase locking than dissonant pitch intervals, implying that the perceptual allocation related to the preference of consonance could be a by-product of innate sensory-level processing [12]. Similar conclusions were obtained in behavioral studies in children: newborns prefer listening to consonant rather than dissonant musical sequences and don't like atonal melodies if compared to tonal songs. In particular, functional MRI was used to measure brain activity in 1- to 3-day-old babies while they heard excepts (21 s long, average tempo of 124 beats per minute) of Western tonal music (original piano music drawn from the corpus of major-minor tonal classical music by Bach, Mozart, and Schubert) and altered versions (with changes of tonal key or permanently dissonant) of the same tracks.

Music evoked predominantly right-hemispheric activations in primary and higher order auditory cortex (superior temporal gyrus, transverse temporal gyrus and planum polare, planum temporale and temporoparietal junction), confirming that music

perception with hemispheric functional asymmetry (activation with right-hemispheric dominance) is present at birth. When presented with altered music, activations emerged in the left inferior frontal cortex and limbic structures. This pattern of activation presumably reflects a sensitivity to dissonance. These data corroborate the hypothesis that hierarchical representation of musical pitch is demonstrated at a subcortical level, suggesting that a listener's judgment of unpleasant (not pure) or pleasant (pure) sounding melody may be rooted in low-level sensory processing, governed by the fundamental capabilities of the auditory system. The perception of sensory dissonance is a function of the physical properties of auditory stimuli, as well as those of basic anatomical and physiological constraints, resulting from limitations of the auditory system in resolving tones that are proximal to pitch [13].

Moreover, it is interesting to observe how the analysis of the harmonic frequency of the human vocal spectrum (statistical structure of human speech) highlights a probability distribution with peaks that correspond to intervals of octaves, fourths, thirds, and major sixths, which are the intervals of the pentatonic scale. This suggests that the human ear could have an innate aesthetic and subjective preference for specific intervals, and this is hence linked to speech "sounds" (vocalizations) and to how the brain encodes them in the superior temporal cortex. So, humans prefer tone combinations that reflect the spectral relationships of human vocalization: across cultures, harmonic structure of speech closely parallels that of music, bearing in mind that human vowel sounds are based on the chromatic scale.

Are we consequently predisposed to take pleasure in harmony? Still, we are also fascinated by birdsong and the chirping of cicadas. After all, are these only sounds or do we find in them a musical coloring that lets us appreciate them on an emotional level? Why do animals make sounds? Many animals have sound-producing and sound-processing abilities. They process sound as it occurs within a time, ascribe a sort of meaning to this sound, and adjust their behavior accordingly.

Let's thing of the cricket. It produces distinct sounds thanks to the movement of its elytra, as a result of specific muscle activities and a system we can regard as musical. The phrase is peculiar to each species and is typically composed of five notes alternating with trills and sounds we could define as "cri-cri." This music serves as a sexual call for the species. A female does not react to the chirping of a male belonging to another species.

Thanks to a specialized phonate system named syrinx, birds can produce cries (of danger or as a call), whistles (sounds with a stable frequency within a time), and also actual songs. Among the nearly 9000 species of existing birds, at least 40% can elaborate harmonies: organized sounds made of specific note pitches, frequency variations even within the same note, and intervals between phrases. The cuckoo, for example, executes a song that is always characterized by the same interval, a third. When examining more complex elaborations, the case of the white wagtail (*Motacilla alba*) is paradigmatic as it produces an articulated melody, entirely individual to the species, composed first of a whistle, then of some modulated notes clustered in two types of syllables, and finally of a kind of humming, different from the initial whistle. In this species, we even find specific "dialects," different sonorous articulations depending on the region the birds are found. This means that there is the possibility that also animals can learn musicality and evolve their singing. Birdsong has a social

and utilitarian function. It serves to distinguish between family members and strangers, to demarcate a territory, and to promote sexual activity. Birdsong also follows yearly, or even daily, rhythms and is a kind of signal or program.

So, does music have a sort of adaptive function also in humans? Does it enhance cooperation, social cohesion, and assistance within a group? Is there a sort of continuity across species whereby musical sounds are able to influence physiological processes that increase physical and mental well-being?

It is in fact likely that a possible reason that music arises and endures is because it brings people together. Music definitely has a function in social cohesion. Music can be used for communication and has a ritual significance in every religion.

From an evolutionary point of view, spoken language and music evolved from a proto-language driven by gesture, framed by musicality, and performed thanks to the flexibility that accrued with continuous anatomical developments, not only in the brain, but also in the coordination of our laryngeal, pharyngeal, and facial muscles. So, as cultures evolves from simple to complex, moving from primitive to civilized, music evolves from simple to complex within societies as they progress. In this context, recent studies confirm that music is able to activate both phylogenetically ancient reward/valuation brain systems (striatal, limbic, and paralimbic) and more evolute perception/prediction systems (temporofrontal) [14]. This pattern may be interpreted as a possible indicator that the human brain holds an adaptive neural specialization for processing music as a rewarding stimulus, although only with an aesthetic value. Music for pleasure, then, is one of the hallmarks of what it means to be a human being.

Photo: "The art ensemble," courtesy of Guido Borso

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