# All Sound is Music

## On Musical Definitions

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Senior Honors Thesis, Fall ’20 – Winter ‘21

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# Section 1: Introduction

## Defining Music

Broadly construed, the project of defining music is to find the necessary and sufficient conditions which, when met by *x*, entail *x*'s being music. Let us call this the *General Definition Project*.

> *General Definition Project*: To find the necessary and sufficient conditions which, when by *x*, entail *x*'s being music.

The *General Definition Project* is not the target of this paper. The reason I mention it however, is because in attempting to answer the *General Definition Project*, many have, often tacitly, taken on a much more demanding and stricter project, the project of finding the *essence* of music on non-aesthetic grounds. Let us call this the *Strict Definition Project*:

> *Strict Definition Project*: To find the necessary and sufficient conditions which (i) when met by *x*, entail *x*'s being music and (ii) are not based in aesthetic grounds, and (iii) capture the essential nature of music.

The *Strict Definition Project*, as opposed to the general one, includes the addition of two conditions for a musical definition. Let us analyze the motivations for each of these conditions in turn:

The first addition, (ii), states that a musical definition must not be based on aesthetic grounds. If the concept of music rests on aesthetic grounds, then there is no room, conceptually speaking, for bad (or non-aesthetically satisfying) music. This is unintuitive. A child's first forays into the violin and a late-night karaoke rendition appear to be examples of music, independent of our judgements of their aesthetic qualities. Seemingly, any definition of music ought to leave room for bad music, and therefore cannot rest on aesthetic grounds. This reasoning is sound. Insofar as we wish to undertake a definitional project in the first place, and we want the definition to conform to our intuitions, excluding aesthetics-based definitions is the correct approach.

The second addition, (iii), states that a musical definition ought to capture the essential nature of music. It is hard to discern in formal terms what constitutes *essential nature*, and few who employ the concept take the time to spell it out. As I take it, the 'essential nature' of concept, *x*,

is, roughly speaking, the minimum set of properties shared by all members of the set of all *xs*. The idea that there is an essential nature to music, and this essential nature is definable, is intuitive. Most of us know, almost immediately, whether a sound is music or not. If the concept of music is so complex as to elude a relatively simple statement of its essence, then our ability to quickly discern music from non-music becomes hard to explain. Furthermore, our intuition also suggests that the concept of music is something above 'a sound is music if and only if it is x or y or z or a or b or c…'. The essential nature of music must capture more than mere extensional adequacy.

Out of the two conditions added to the *General Definition Project* to form the *Strict Definition Project*, the second, the necessity to capture the essential nature of music, is the more controversial. Due to the centrality of the essential nature intuition, I will call proponents of the *Strict Definition Project*, *musical essentialists*. The aim of this paper is to show why an answer to the *Strict Definition Project* is not possible. In doing so, I wish to show that there is no aesthetic-independent essential nature to music. In other words, I wish to show that it is impossible to delineate between music and non-musical sounds on non-aesthetic grounds.

## Why Should We Care?

The *Strict Definition Project* aims to find a non-aesthetic definition of music. The question immediately arises 'why should we care?'. After all, disagreements between definitions could merely reflect semantic disagreements, disagreements in how the term 'music' ought to be used. To put it into analogy, consider the categories of film, *thrillers*, and *dramas*. The terms 'thriller', and 'drama' merely pick out films with specific characteristics as a means of expediting communication. If you and I disagree about a movie's status as a thriller or drama, that disagreement has little bearing on our ability to talk about the that film. We can aesthetically evaluate the qualities of a film without ever referencing its status as a thriller or drama. The distinction between music and non-music might be like the distinction between thriller or drama. If that is the case, then the definition of music is of little philosophical interest. Current philosophical writings on the topic on the topic do little to alleviate this concern[1]. In this section I

[1] Kania (2011, p.5) states the primary motivation for defining music as "curiosity about the nature of an art that is central to many people's lives". I am hardly moved by this, especially since it is unclear why such a curiosity ought not to be answered by sociologists, psychologists, or linguists, rather than philosophers.

wish to show that musical definition is not trivial. Music definition is philosophically relevant because musical definitions have wide normative implications and inform higher level questions in the philosophy of music.

First, the concept of music has normative implications, normative implications which ultimately inhibit the creativity of artists. For this reason, the question of musical definition is not trivial. Musical definition influences how we analyze music[2], how we teach music, how we share music. Most importantly, it affects the music musicians create. These normative implications reveal themselves in the resistance to works of music using new techniques and technologies. Edgar Varese, an experimental composer from the early 20th century, was one of the first composers to utilize sampled sounds: rearranging them, splicing them, and pitching them, using the newly popularized magnetic tape. He remarked on the resistance he faced when presenting his new works of music:

> "people who, while admitting that it is 'interesting,' say, 'but is it music?' It is a question I am only too familiar with. Until quite recently I used to hear it so often in regard to my own works…as far back as the twenties"[3]

Those who wish to utilize unconventional musical techniques are tasked with justifying their works, even when the intention of such artworks is not necessarily subversive or revolutionary. Varese remarked:

> "[I am in a] fight for the liberation of sound and for [the] right to make music with any sound and all sounds"[4].

Convention informs ideas about the essential nature of music. These ideas become a musical definition. Since it is believed that this definition represents a deep-seated truth, it is used to put boundaries, explicit or implicit, on the creators of new music. Musical definition serves to reinforce the convention from which it arises, and for this reason it inhibits creativity. It is for

[2] For an example of how the notion of an essential nature of music has influenced psychoacoustic studies of music see Stevens, Byron *Universals in Music Processing.*
[3] Varese (1966)
[4] ibid.

this reason that I wish to uproot the notion of *musical essentialism*. The normative standards which arise from it inhibits the creativity of artists.

Another reasons I take interest in the question of musical definition that philosophy of music has interesting questions, and these questions cannot be answered properly unless *what music is* is adequately clarified. If higher-level questions in a philosophy of *x* are to be properly addressed, there must be some definition of *x* which is generally accepted. Or at least, a definition of *x* which is not severely conceptually misguided. Philosophy of music has interesting higher-level questions: what constitutes a good musical performance? is sampling ethical? what is the relationship between generative strategies and musicians? If attempts to define music are as misguided as I intend to show they are, then any discussion which adopts any of these attempted definitions is misguided as well. Imagine two philosophers, let us call them *G* and *M*. Suppose *G* is attempting to answer the question: 'what makes a good performance of a piece of a music?':

> As a matter of background information, 4'33'' is a piece by John Cage in which a performer is instructed to remain silent for the duration of the piece's three movements.
>
> G's Proposal: A performance of a piece of music is a good performance if and only if the sound of the performance is directly causally connected to the instructions of the composer.
>
> M's Counterexample: 4'33'' is music. In a good performance of 4'33'' the sounds of performance are not causally connected to the instructions of the composer. Therefore, a good performance of 4'33'' is a counterexample to G's proposal.
>
> G's response to M's Counterexample: 4'33'' is not music. Therefore, M's counterexample is not a counterexample to my proposal.

In the end, the debate between *G* and *M* is no longer about musical performance, it is about musical definition. If higher level questions of philosophy of music are to be properly discussed, then there must not be debate about what is and is not music.

# Section II: Methodology

We have made clear what the project of musical definition is, and why an answer to that project might be important. The question now becomes, when confronted with a potential answer to the *Strict Definition Project*, how might we decide whether or not that proposal holds? In this section, I will outline three conditions which any answer to the *Strict Definition Project* must satisfy.

## Non-Triviality Condition

A musical essentialist would not be satisfied with saying that the essential nature of music is that it is a sound. That would be tantamount to the claim that there *is no* essential nature to music, since there would be nothing which separates music from other sounds. Many musical essentialists take this point as an obvious fact, Kania states:

> "Even if you think sounds are necessary for music, they are certainly not sufficient. Sounds occur throughout the world all the time, and few of those are music. We might describe certain sounds as music-like…yet still deny, when speaking strictly, that these sounds are really music"[5].

Let us call this the *Non-Triviality Condition*:

> *Non-Triviality Condition*: A music definition must not include *all* sounds.

## The Intuitive Condition

Under the essentialist position, the picture of music and our relationship to it as follows: Often we can tell what sounds are music and what sounds are not. In cases in which we are not sure, or we make the wrong judgement, we will change our beliefs in light of new information. For example, I might pass by a church and hear what I believe to be a non-musical prayer. When my friend tells me that it is actually a ceremonial song, I will admit my mistake and revise my belief. So, the essential nature of music seems to be something we intuitively know, since we are able to

[5] Kania (2011, p.5)

evaluate music we have never heard before as such[6]. If there is a near universal intuitive understanding of the essential nature of music, and the project of musical definition is to make explicit this intuitive universal understanding, then any proposed definition of music must conform to our intuition. Let us call this the *Intuitive Condition:*

> *Intuitive Condition*: a definition of music must conform to our intuitions.

This point is somewhat obvious: if the project of musical definition is to make clear our intuition, then clearly it must conform to that intuition. Levinson explicitly states the *Intuitive Condition,* stating:

> "We will have succeeded [in our project of musical definition] if all and only those things that, on reflection and after consulting our intuitions, we are willing to count as music…satisfy the proposed conditions"[7].

However, we must tread carefully. We would not want to argue that it must conform to *all* intuitions. For example, someone having grown up only with banjos might hold the intuition that the banjo is the only thing which can make music. We do not want to say that a musical definition must conform to this intuition. Therefore, 'conforming to intuition' must mean, in some sense, conforming to those intuitions which are not culturally[8] created or influenced.

But how can we distinguish between cultural and non-culturally influenced intuitions? This is a sound concern. One which, from the outset, reveals how the intuitive condition sets itself on the precipice of a wide range of broader philosophical issues surrounding the accuracy of intuition. Despite this, it is conceivable that there are culturally influenced and non-culturally influenced intuitions, and that the former can be separated from the latter through positive argument. For example, the intuition that our eyes accurately report the state of the world seems not to be culturally influenced. It is hard to imagine how my being born in a different culture would alter that intuition. The musical essentialist would argue that there are musical intuitions which have this status. To argue this, they might cite that the intuition is shared across radically different cultures. Seemingly, arguments of this form are valid. It is reasonable to assume that positive

[6] Hamilton (2007, p.48) supports this point by citing how quickly African cultures have adapted to the Western conception of music, even when such a concept did not originally exist.
[7] Levinson (2011, p.268)
[8] I use 'culturally' here in a loose sense to mean one's environment, social interactions, community etc.

arguments can be made to separate culturally influenced intuitions from non-culturally influenced ones.

## The Functional Condition

The proponent of musical definition argues that we have an intuitive, but nebulous and vague, but nonetheless somewhat universal understanding of music. The goal of musical definition is to make clear and precise this nebulous and vague universal concept. If this is the case, then an adequate musical definition should be able to, at least on some level, answer the question 'is this sound music?'. Levinson states:

> "…[a definition of music] would serve as an answer to the straight-forward question 'what is music?'"[9]

To elaborate, let us divide the functional condition into two sub-conditions, *Epistemic Accessibility*, and *Clarity*.

A musical definition, if it is to be able to answer the question 'is this sound music?', must be the kind of thing we could come to know. Let us call this *Epistemic Accessibility*:

> *Epistemic Accessibility*: The conditions of a musical definition must be the kinds of things we can come to know.

To see why this is the case, consider the following definition which is *not* epistemically accessible:

> *Soul definition*: A sound is music if and only if it stands in a special relation to our soul.

Assume souls exist. If souls exist, then the above definition might be true. Even if it is true, the above definition does nothing to inform our understanding of whether a sound is music. I would have no way of knowing if *Moonlight Sonata* is a piece of music or not, since I have no way of knowing whether it stands in that special relation to our souls or not. The soul definition fails as a musical definition precisely because it does not meet the *Epistemic Accessibility* requirement.

[9] Levinson (2011, p.267)

A musical definition, if it is to be able to answer the question 'is this sound music?', must also be significantly clear. The terms used in a definition cannot be vague or ill defined. Let us call this the *Clarity Requirement*.

> *Clarity requirement*: A musical definition must be significantly clear.

To see why this is the case, consider the following definition which does not meet the *clarity requirement*:

> *Structure definition*: A sound is music if and only if it is *structured.*

*Structure,* especially in the context of sounds, is a vague concept. It is not well defined. When can a sound be said to be structured? In one sense, the sound of cars passing under a bridge might be said to be structured, in that there is a specific pattern and organization the sounds of the cars follow. But in another sense, they are unstructured, in that there is certain element of randomness to their organization. Notice the structure definition is *epistemically accessible. Structure* seems like the kind of thing one can come to know. My time at my job might be structured, while my time relaxing might be unstructured. Despite meeting the *epistemological accessibility requirement*, this definition still does not help us determine whether a particular sound is music. Since the concept of structure is so vague, the structure definition does not meet the *functional condition.* Again, the structure definition is not intended to be a serious attempt at musical definition. Rather, it is illustrative of the fact that adequate musical definitions cannot defer to unclear terms.

Putting these two together, we can say:

> *Functional Condition*: A definition of music must be epistemically accessible (epistemic accessibility) and significantly clear (clarity requirement).

## Conclusion

In this section, I argued that definitions for the essential nature of music are committed to three conditions:

1.) *Non-Triviality Condition*: The essential nature of music cannot merely be 'being a sound'.

2.) *Intuitive Condition*: A definition of music must conform to our intuitions.
3.) *Functional Condition*: A definition of music must be epistemically accessible (epistemic accessibility) and significantly clear (clarity requirement).

The strategy of this essay is to examine potential musical definitions and see how they each fail to meet one of these conditions. Consider that there are three distinct categories of a musical 'transaction': the creator of the sound, the sound itself, and the listener. I will take each of these categories in turn.

# Section III: Properties of the Sound Itself

In this section I will cover definitions based on aspects of the sound itself. I will begin by considering musical definitions based on physical properties. I will then consider musical definitions based on the perception of those physical properties.

## Physical Property Based Definitions

Sounds have two properties: frequency, and amplitude. Consider the sound of a tuning fork. When a tuning fork is struck, it emits a clean tone at a given frequency. The sound a tuning fork is a sine wave. If a tuning fork is tuned to 440hz, then 440 sine wave periods occur every second after the tuning fork is struck. If we look at the frequency distribution of a sine wave, we see that a sine wave has only one frequency 'component' in its frequency distribution.

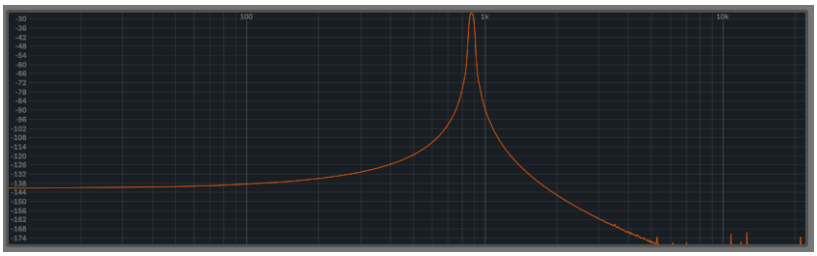

*Figure 1 frequency distribution of a sine wave at 440hz*

Consider the sound of square wave (the buzzing sound you might get from a cheap alarm clock). A square wave has the following frequency distribution:

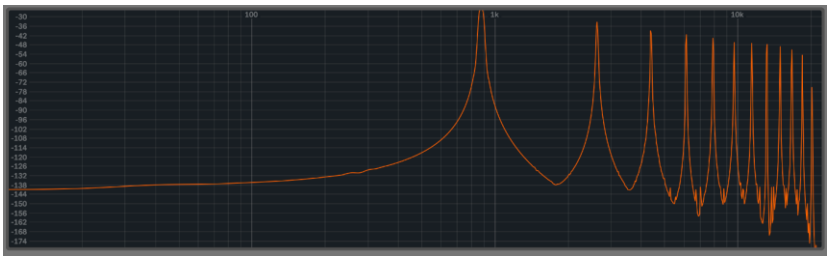

*Figure 2 The frequency distribution of a square wave at 440hz.*

The frequency distribution of a square wave looks like a set of sine wave frequency distributions superimposed on one another. The reason it looks that way is because in some sense, it is. A square wave can be said to be decomposed into a set of sine waves at varying frequencies. The reason we hear a square wave as 'buzzy' and a sine wave as 'pure' is because the former includes this set of additional sine waves. In more formal terms, the individual frequency components of a sound are called *partials*. The sum of all partials is known as a sound's *Fourier Series*. All sounds can be represented by their *Fourier Series*.

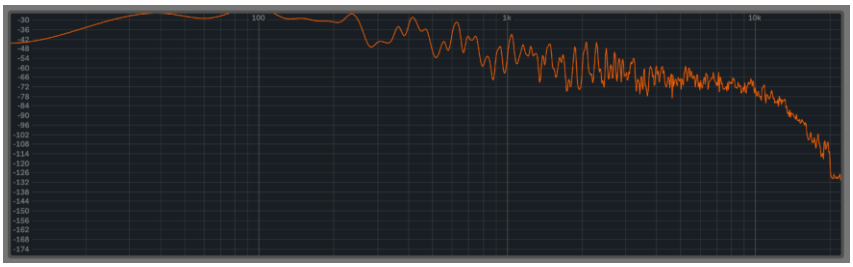

*Figure 3 The frequency distribution of a full mix, including drums, vocals, and guitar.*

So, theoretically speaking, with enough tuning forks all tuned to the right frequencies, you could convincingly resynthesize any sound. Conversely, with tools that remove certain frequencies (known as filters), one could chip away at a sound until only a single partial remained. For this reason, we can say that any sound really only has two physical properties, frequency and amplitude.

A physical property-based definition is appealing because a sound's being music depends only on the sound itself. If a physical property definition holds, music would be like many other objects. An object is a tree when it has tree-like properties. It would be unintuitive to suggest an

object is a tree only when it is *perceived* to have tree-like properties. Similarly, it would be unintuitive to suggest a sound is music only when it is *perceived* as having music-like properties. To illustrate this, consider the following example:

> *The Other Room Case*
>
> A record player is left on. No one is around to hear it. I am in another room, away from the record player, and say, "there is music playing in other room".

If it is true that a sound is music only if it is perceived as having music-like properties, then strictly speaking, I am uttering a falsehood. There is no music playing in the other room, because there is no one around to hear it. We might get around this by saying that what I *really* mean is "if you enter the other room, you will hear music". However, this also has unintuitive consequences. For one, it would say that when someone enters the room, the music enters the room with them. For this reason, a physical property-based definition is appealing. Presumably, a physical property definition would take this form:

> A sound is music if and only if it has physical property *p*.

One possible definition of this sort is that music must contain stable, periodic vibrations. That is, music must have stable, periodic vibrations, opposed to noise, which contains unstable vibrations[10]. This is tantamount to the claim that music ought to have a Fourier Series with primarily discrete frequencies.

> *Stability Definition*: A sound is music if and only if it consists primarily of stable periodic vibrations.

However, this definition is inadequate. *Most* music, even the most conventional, incorporates noise elements, such as unpitched percussion. Is there any other physical property of a sound which might work in a physical property-based definition? As it seems, the prospects of finding such a property are not good. Generally speaking, the physical properties of sounds are inscrutable. Sounds contain vast numbers of frequency components which can change drastically over the course of small amounts of time. Even similar pieces, such as two pieces by the same

[10] Hamilton (2007, p.48) mentions a definition of this sort, although he also concludes that such a definition ultimately fails.

composer, have vastly difference frequency spectra. For this reason, physical property definitions fail to be *epistemically accessible*. If similarities between frequency spectra exist, they do not seem like the thing we can even come to know, at least not without rigorous mathematical analysis.

Even assuming a physical similarity could be found between all music, physical property definitions face a more general issue. Consider that we accept that sounds retain some of their qualities when pitched up or down. A bird call pitched down one octave (its frequency divided by two) is still perceivable as a bird call. A melody pitched up one octave (frequency multiplied by two) still retains its character. Now consider a Bach record pitched up five octaves. The sound of the record would be inaudible. Imagine my record player malfunctions and plays the record at 32 times its normal speed. If I say, "no music is playing", I am not uttering a falsehood. It would be unintuitive to suggest that infrasounds (below hearing range) and ultrasounds (above hearing range) could possibly be music. Since purely physical property definitions ought to be agnostic to who is listening, a purely physical property definition ought to say that the sped-up Bach record is music. So, even if an adequate physical similarity is found between all music, pure physical property-based definitions face the issue of *intuition non-conforming*.

## Perceptual Property Based Definitions

Up until this point in have been speaking *strictly* of physical properties of sound: frequency and amplitude. Initially, I stated that definitions based purely on physical properties are attractive because they circumvent cases like *The Other Room* case. However, there might be a way to circumvent *The Other Room case* without speaking only of strict physical properties of sounds. We have strong reason to think that the concept of music is a human dependent concept. That is, the essential nature of music involves, in some way, the contingent properties of humans. Consider the concept of a *chair*. Plausibly, the concept of a chair includes a way to support one's back (otherwise it would be a stool, not a chair). The concept of chairs including a way to support one's back arose because of facts about human anatomy. Namely, it arose as a result of the relationship between our backs and other parts of our body. If human anatomy were different, our concept of a chair might not include that chairs have backs. However, this need not entail that a chair is a chair *only* when a human is sitting on it. To conclude that would be absurd. An object is a chair when it has chair-like properties, just like a tree is a tree when it has tree-like

properties. If all humans disappeared tomorrow, there would still be chairs and there would still be trees. So, maybe we can find a subset of physical properties of sound which is informed by human perception. To start, physical properties of sound are perceived in a way heavily altered by properties of our biology. At the most fundamental level, we only perceive certain frequencies. Within that range of perceivable frequencies, we perceive certain frequencies as rhythms and certain frequencies as continuous tones, or pitches. So, let us examine the properties of pitch and rhythm in turn.

Pitch

Generally speaking, 'pitch', is the perception of certain frequencies as continuous tones. More specifically, approach to pitch in musical definition can be done in different ways. What constitutes a 'pitched sound' can vary between theories, and few philosophers take the time to explicitly define what specifically what they mean by pitch[11]. In this section, I will refer to a term 'strict pitch'. This is opposed to general pitch, which is simply the idea that pitch is perceived frequency. Other philosophers have called this 'musical pitch', or 'tone', but I have opted for the term 'strict pitch'.

> *Strict Pitch*: A sound is pitched only if the sound's perceived frequency corresponds to a musical scale.

The first important point worth noting is that we are speaking here of 'perceived frequency'. This is to account for human tolerances in frequency perception, such as the fact that we still register a stable pitch despite slight variations in the frequency over time (such a violin note played with vibrato). The second important point is that this definition is not useful until we define what a *musical scale* is, so let us define musical scale:

> *Musical Scale*: A series of pitches repeating at the octave.

[11] Hamilton (2007, p.48) and Kania (2011, p.8) both remark that pitch is an 'intentional' concept. I fail to see how this is the case. I might intend to play a C3 on my guitar but play a C#3 instead. It is not clear how that intention to play C3 affects the pitch of the sound being played. Kania argues that since we perceive certain frequency ranges (violin with vibrato, naturally detuned instruments) as a certain pitch, independent of frequency, that pitch is not merely the perception of frequency, but also contains a relativized intentional aspect (how we intend pitches to relate to one another). However, perceiving certain frequency ranges as the same pitch can be explained simply by natural human tolerances in pitch perception (for more on this see Roads [2015])

An octave above a given pitch is two times its frequency while an octave below is one half its frequency. This definition of musical scale is one adopted by Kania, who ultimately utilizes the concept of 'strict pitch' in his proposed definition, stating that "the division of sounds into scales, consisting of a series of discrete pitches repeating at the octave…." is a "culturally universal" feature of music[12]. In western culture, the most common musical scale is the chromatic scale (the notes on a piano keyboard). The chromatic scale divides octaves into twelve notes, so the frequency relationship between adjacent notes is $2^{1/12}$. However, the chromatic scale is not the only musical scale. Other musical cultures adopt radically different musical scales. Any definition of pitch useful in a musical definition ought to be culturally agnostic, so we cannot privilege one musical scale over any other. Now that the definition of musical scale has been outlined, it might be useful to define the concepts of melody and harmony. This is because music is not merely a 'pitched' sound. Music, insofar as it includes pitch, is often the interplay between different pitched sounds over time.

> *Strict Melody*: A sound is melodic if and only if it contains successive strict pitches.
>
> *Strict Harmony*: A sound is harmonic if and only if it contains multiple strict pitches at the same time.

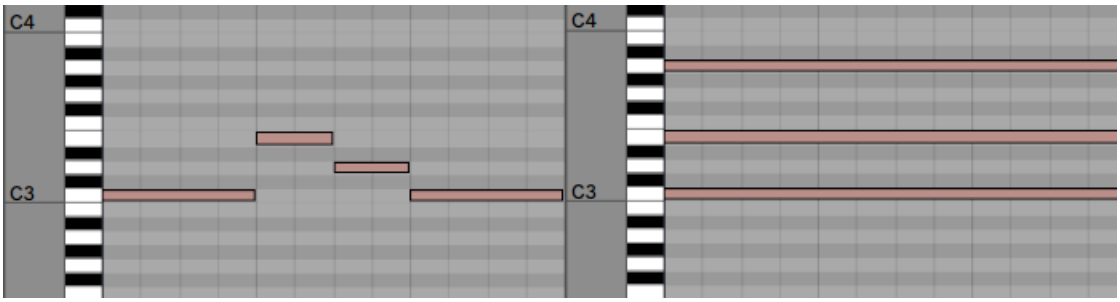


*Figure 4 Melody (left), Harmony (right) where the y-axis is pitch and the x-axis is time.*

From this, we can construct the following conditional:

> *Strict Pitch Condition*: If a sound contains strict melody or strict harmony, then it is music.

The strict pitch condition appears to capture much of what we consider pitched music. Beethoven's *Moonlight Sonata* would easily be music under this condition, since it contains both

[12] Kania (2011, p.7)

melody and harmony containing pitches corresponding to the chromatic scale. Furthermore, the strict pitch condition excludes sounds such a birdsong, since those sounds do not conform to a musical scale.

Issues with the Strict Pitch Condition

Recall that the strict definition of pitch required that sound conform to a musical scale, where a musical scale is a successive series of pitches repeating at the octave. Despite wanting to avoid it, this definition of pitch, when taken seriously, ends up including all sounds. Any sound conforms to a musical scale insofar as musical scale is defined as broadly as earlier. Consider a musical scale which divides the octave into $10^{30}$ successive pitches.

*Encompassing Scale*: Successive pitches are related to one another by a ratio of $2^{10\text{^-}30}$.

The *Encompassing Scale* conforms to the definition of musical scale stated above, it is a series of pitches repeating at the octave. Therefore, any sound which contains frequencies corresponding to those on the *Encompassing Scale* conforms to the strict pitch condition and should therefore be considered music. The *Encompassing Scale*, however, encompasses all sounds. All sounds conform to the *Encompassing Scale*. All sounds can be broken down into a set of $10^{30}$ composite frequencies between octaves, including noise. Any deviations in a sound from the *Encompassing Scale* can be discounted as natural variations in frequency, such as a naturally detuned instrument or an instrument played with vibrato. Recall, the Non-Triviality Condition outlined in Section 2 of this paper:

*Non-Triviality Condition*: A music definition must not include *all* sounds

The definition of pitch above ends up being more general than intended. It ends up including all sounds. Therefore, the definition of pitch above fails the *Non-Triviality Condition.*

## Rhythm

We can think of rhythm as the low frequency correlate to pitch. Generally speaking, if fluctuations in a sound are periodic between 10 beats per minute and 360 beats per minute, we feel a regular pulse[13]. With this in mind, we can define rhythm as follows:

[13] Roads (2015, p.139)

*Rhythm*: The hierarchical organization of musical events according to a steady beat.

But what is 'hierarchical organization'? In western music, the hierarchy of rhythm is divided into measures, which in turn are divided into patterns of 'strong' and 'weak' beats. This hierarchical organization is often referred to as 'musical meter'. This western notion meter can be used to describe a wide array of music, even those from non-western cultures. Given that the concept of meter appears sufficiently general, we might be inclined to make our definition of rhythm more precise by including the concept of meter:

*Rhythm**: The metered organization of musical events according to a steady beat.

Despite its apparent generality, the concept of meter is itself culturally informed. Indian music, for example, contains the concept of "tala", a nested cyclical organization of rhythm which differs in significant ways from the western concept of meter. When listening to music, northern Indian listeners infer tala where wester listeners infer meter[14]. So, our definition of rhythm, *rhythm**, will not work in a musical definition since it is culturally informed. We must revert to earlier definition of rhythm as simply the hierarchical organization of musical events to a steady beat. With this definition of rhythm, we can construct the following musical condition:

*Rhythm condition*: If a sound is rhythmic, then it is music.

It is easy to see how this condition captures much of what we call 'rhythmic music'. A hip-hop drum beat, for example, would easily conform to this definition. The sound of a cars passing under a bridge would not.

Issues with the Rhythm Condition

There are certain cases which show that our concept of hierarchical organization according to a steady beat must be more general. For example, Erik Satie's *Gnossienes*, a set of free-flowing gentle piano compositions, for the most part, lack a time signatures or bar lines to separate measures. The pieces are considered to be written in 'free time', where the performer intuits how long to spend on each note. While we might be inclined to discount *Gnossienes* as arhythmic, there is a clear sense in which the pieces *are* hierarchically organized according to a steady beat, and I believe that intuition would be widely held. Similarly, a lot of music, even the most

[14] Stevens, Byron (2009)

conventional, employs changes in tempo over the course of the song (in musical terms this is often called 'metric modulation'). So, clearly for a sound to be rhythmic, it need not be hierarchically organized to the same steady pulse over its entire duration. We must revise our definition of rhythm to allow for metric modulation. Another issue for this definition of rhythm is that of polyrhythms. Polyrhythms are two simultaneous rhythms played together but not derived from one another. Polyrhythms are perceived rhythmically, even though they derive from multiple 'steady pulses', rather than from a single one. A polyrhythm can therefore be thought of as the hierarchical organization of musical events according to *multiple* steady pulses. The picture is further complicated by the fact that rhythm can be expressed by significant change in *any* musical parameter. The most common musical parameters to express rhythm are pitch (such as the rhythm of a melody), or amplitude (such as the rhythm of a drum beat). However, other parameters of a sound might be altered to produce a rhythm, such as the cutoff of a filter, effects such as reverb or chorus, panning in the stereo field, and so on[15]. Provided these details, it appears we must revise our original definition of rhythm as follows:

> *General Rhythm*: A sound is rhythmic if and only if it includes successive sounds which contain significant parameter changes organized by any number of steady beats.

'Successive sounds' addresses the concept of metric modulation, and 'any number of steady beats' addresses the concept of polyrhythms. We can now revise our rhythm condition as the following:

> *General Rhythm Condition*: If a sound is generally rhythmic, then it is music.

The *general rhythm condition* runs into the same issue as the concept of pitch. Under the *general rhythm condition*, all sounds are music. The sound of cars passing under a bridge for example is music. Each lane of the street represents a steady pulse, and variations in the durations between cars can be thought of as rhythmic modulations. The sound of the wind through tall grass can by thought of as a polyrhythm, where each blade of grass conforms to its own steady pulse of

[15] One can see the manifestation of this idea in the concept of 'automation' in digital music making. Digital Audio Workstations such as *Ableton* often contain the ability to modulate any parameter of a sound according to a rhythmic grid.

movement. Therefore, the *generally rhythm condition* fails the *non-triviality condition*. The *general rhythm condition* ends up including all sounds.

# Section IV: Properties of the Creator

The search for "musical properties" as the essential nature of music does not work. For this reason, many proponents of musical definition turn their attention to *intention-based* definitions. Seemingly, every sound we intuitively understand as music is the result of some intention. These are definitions based on the creator of the sound. The wind might blow through the trees and produce a melody resembling *Mary had a Little Lamb*. However, the trees and the wind are not producing music since there is no creator of the sound with a specific intention. Generally, I take it that an intentional definition of music would take the following form:

> *Intentional definition*: A sound is music if and only if it was created with a certain intention.

But what might that intention be? It cannot be the intention to produce *music.* That would be very clearly circular. Various proposals have come forth as to what this music making intention is. For the purposes of this section however, I will not concern myself with the merits and faults of various intentional proposals. I wish to criticize the use of intention in musical definition in general. For this reason, I will abstract out the specifics on the intention which is used to fill in the intentional definition. For the rest of this section, consider *MI* (for musical intention) to be any intention used to complete the intentional definition.

## Epistemic Problems with Intention

Even if it is the case that only sounds created with a certain intention are music, the fact still remains that we can never *really* know what any creator's intention is. In the many cases in fact, an artist's intentions might be *completely* obscured by memory or death. Consider the following case:

> *The Harmonophone Case*
>
> Inventor, John Harmon, records himself testing his new prototype of his new musical instrument, the *Harmonophone*, so that he can listen back for technical evaluation. His

> intention is *not* to produce any type of music, but simply to record the instrument to later analyze. Long after his death, his family discovers the tapes. Given the popularity of the *Harmonophone* and the general beauty of the recordings, they decide to release the tapes posthumously as *The First Recorded Music of the Harmonophone*.

In this case, John had no musical intention *at all* in his production of tapes. Yet, his family released the tapes as *The First Recorded **Music** of the Harmonophone*. Insofar as a musical definition requires a certain intention on the part of the creator, *The First Recorded Music of the Harmonophone* is not music since the creator had no musical intentions. Debate over the intention of dead artists is not uncommon. It is easy to see how a case like *The Harmonophone Case* might occur. Recall that for our definition of music to be adequate, it must satisfy the *functional condition*. It must on some level be able to answer the question 'is this sound music?'. To do this, a definition must be *epistemically accessible*. The definition must be the kind of thing we can come to know. In many cases, intention is not the kind of thing we can come to know. At best it is the kind of thing we can infer, and at worst it is completely inaccessible to us, such as in the *Harmonophone Case.*

## Technology and Intention

Insofar as a musical definition is supposed to reveal the essential nature of music, it must be technologically agnostic. A true musical definition must leave room for future technologies. This poses a problem for the concept of intention. Our notions of intention can be radically changed by advances in technology. Consider how the invention of the camera changed the intention in the visual arts. In a painting, it would be clear that every part of the frame was the product of an intentional action since every element of the painting was put there deliberately by the painter. But to what extent could the same be said about a photograph? Analogously, consider how recording technologies have changed intention in regard to music. The sound of falling rocks might be stretched and morphed into a drum beat. The sounds of dolphins might be transformed into sweeping choral pads. Or more simply, the sound of birds may be placed in the background to breathe life into a song. Insofar as the origin of these sounds is something external, captured by the artist, to what extent can we say that those sounds were produced as the result of intentional action?

Furthermore, consider generative strategies in music making. Imagine a synthesizer is fed a random melody while the performer 'steers' this randomness by changing the upper and lower bounds, the rate etc. Such a technique is common in in modular synthesizer, in which complex networks of control signals are used to create compositions. What can we say about intention in the case of generative music strategies? The picture of intention's relation to music is complicated by these techniques. No individual musical event is the result of any intentional action on the part of the composer. Previously, chance procedures were typically relegated to avant-garde musicians, and were considered on some level, iconoclastic. However, new technologies have made this view untenable. The use of generative techniques has become commonplace in music making[16].

We can see how technological advancements have complicated the discussion of intention in the past, so it is easy to see how future technologies might complicate our current idea of intention even further. This is not to say that intention cannot factor at all into a musical definition. Rather, it is to show that intention inherently has properties which make it unattractive for the project of musical definition.

## Intentional Entanglement

The largest issue with the use of intention in musical definition is what I will call 'intentional entanglement'. Intentions are tangled together in a significant way, a way that complicates their use in a musical definition. Clearly intentions can be tangled together. In making a piece of music, one might have political (the intention to spread a political message), artistic (the intention to express oneself creatively), and monetary intentions (the intention to make money), all at the same time. Furthermore, these intentions might all push and pull on each other in complex ways. Monetary intentions might inform one's political intentions, political intentions might inform one's artistic intentions, and so on. With this in mind, the question becomes: 'what role does *MI* (recall that *MI* is whatever intention is used to fill in the intentional definition) have to have on a creator's network of intentions for that creator's sound to be considered music?'. An initial attempt might look something like this:

[16] The popular digital audio workstation *Ableton* now includes a setting for per-note probability. Ironically, generative strategies are often used to 'humanize' music by simulating natural human error which might not be present in a strictly digital composition.

> *Primary Intention Definition*: A sounds is music if and only if it is created with *MI* as the primary intention.

Here, I take 'primary intention' to mean the intention which "has the final say", the intention which exerts the most force on a creator's network of intentions. A politically charged song, despite having political intentions, is music insofar as *MI* is the primary intention. A poem, despite the poet having minor musical intentions (the poet might want the poem to be listened to on a musical level), would not be music insofar as the poet's primary intention is not *MI*, such as the intention to tell a story.

Issues with the Primary Intention Condition

The primary intention definition is a biconditional. That means that if a sound is music, then it must have been created with *MI* as the primary intention. No matter what *MI* is, it is clear that a lot of music is created where *MI* is not the primary intention. Lots of music is created where non-musical intentions exert the most force. Consider, for example, music which is created with a primarily monetary intention. If there was no monetary incentive, this person would not be making music. One can imagine easily that lots of music, especially music conventionally regarded as such, such a pop music, has been created under with these intentions. Under the primary intention definition these works would count as music. This is unintuitive, so the *primary intention definition* fails to meet the *Intuitive Condition.* A proponent of intentional definitions might respond that they wish only to speak of artistic intentions. After all, we are speaking of an artistic practice, so our discussion should be limited only to artistic intentions. They might revise the primary intention definition as follows:

> *Primary Intention Definition**: A sounds is music if and only if it is created with *MI* as the primary artistic intention.

The particulars of the distinction between artistic and non-artistic intentions aside, it seems intuitive to say that monetary intentions are *not* artistic intentions. While the original *primary intention definition* was intuition nonconforming, the revised *primary intention definition** might not be. However, this does not get the *primary intention definition* far. Many songs contain lyrics, and those lyrics contain narrative or poetic elements. We can easily imagine a song which

is created with primarily narrative or poetic intentions[17] rather than musical intentions. The primary intention definition entails that these works are not music, so the issue of intuition nonconforming still persists.

The failure of the primary intention definition might incline one to lower the importance musical intention. Maybe we should not be looking at primary vs. secondary intentions, but rather just the presence of the intentions at all. A sound might be music not if and only if *MI* is the primary intention, but if and only if *MI* is present in some form, regardless of the other intentions of the creator of the sound:

> *Presence of Intention Definition*: A sound is music if and only if it was created with a certain amount of musical intention.

Consider the following two works:

> *A:* A song created with the intention of conveying a narrative.
>
> *B*: A narrative poem which employs some musical elements.

Intuitively, we want to say that *A* is music and *B* is not. Insofar as the 'certain amount of musical intention' required for a sound to be music is in between the amount of *MI* present in *A* and the amount of *MI* present in *B*, then the *presence of intention* definition is *intuition conforming*. However, this immediately indicates that the *presence of intention* definition is unacceptably vague. The notion of a 'certain amount of musical intention' is not clearly defined, so the presence of intention definition fails the *clarity requirement*, therefore failing the *Functional Condition*.

# Section V: Properties of the Listener

We have examined physical property-based definitions and intention-based definitions and concluded that definitions which employ those aspects fail to provide adequate definitions of the essential nature of music. Seemingly, the last potential avenue by which a musical definition could be derived are properties of listener. That is, the essential nature of music is that it is sound

[17] For example, *Hospice* by The Antlers contains an overarching narrative structure intended to convey a complex story about the romantic relationship between a hospice worker and terminally ill female patient. Arguably, conveying this narrative is the primary intention of the album.

listened to in a certain way. Under this view, the internal states of the listener exert a force on the external world by transforming what was previously merely a sound into music. I take it that a listener-based definition would take roughly this form:

> *Listener-based Definition*: A sound is music if a listener of the sound has property *p*.

This definition, like the intentional definitions presented earlier in this paper, faces the issue of *Epistemic Accessibility*. Presumably, property *p* is some sort of internal state, one which we can only come to know in another person through that person reporting it to us. However, on what basis can we say that that person's report is true? They might simply be mistaken or have forgotten. Furthermore, listener-based definitions also fail to meet the *Intuitive Condition.* No matter what property *p* is, it might the case that listener fails to recognize something which we intuitively regard as music, and therefore fail to acquire property *p*. Consider the following scenario:

> *Old Tapes*
>
> James stumbles upon a box of old tapes in his grandfather's attic. The tapes are recordings of the ceremonial prayer songs of the occupants of a small island in the Atlantic Ocean with which very few people are familiar. James disregards the sounds as the sounds of a ship's horn (the prayer song's instruments resemble a ship's horn) and disregards the tape as mere tests of the tape recorder.

Suppose at that moment, James is the only person listening to those tapes. A listener-based definition entails then, that what James is listening to is not music, since he fails to recognize it as music and fails to acquire the property *p.* This is unintuitive. We do not want to say that the music of the occupants of the island fails to be music simply because James fails to recognize what he is listening to as music. Oppositely, consider the following case:

> *Bees*
>
> Joan loves the sound of bees. She has no interest in listening to conventional music. Any pleasure that the average person gains from listening to music, Joan gains from listening to bees. For this reason, she has perm6anently affixed an array of microphones around a beehive in her garden and listens any chance she gets.

Presumably, Joan is the only one listening to the bees. Whatever property *p* is, Joan has it. She listens to the bees totally *as if they were* music. However, it is unintuitive to suggest that that makes the sound of the bees *literally music*. These two examples diagnose the core issue with listener-based definitions. Earlier in this paper, I stated that intuition conforming meant conforming to those intuitions which are not culturally created or influenced. I stated that one of the ways culturally influenced intuitions might be separated from non-culturally influenced intuitions is by showing that an intuition is shared by many people across cultures. This strategy has been employed by musical essentialists in evaluating musical definitions. However, listener-based definitions prevent an argument of that sort from being made, since a sound's status is music is linked only to the intuitions of those listening to it.

# Section VI: Final Thoughts

This section will conclude the paper. Let us now take stock of the arguments which I have presented.

In *Section II*, I outlined the three conditions which the musical essentialist is committed to:

1.) *Non-Triviality Condition*: The essential nature of music cannot merely be 'being a sound'.
2.) *Intuitive Condition*: A definition of music must conform to our intuitions.
3.) *Functional Condition*: A definition of music must be epistemically accessible (epistemic accessibility) and significantly clear (clarity requirement).

In *Section III*, I considered definitions based on the sound itself. I considered definitions based purely on physical properties of the sound (frequency and amplitude) and perceptual property definitions (pitch and rhythm) and found no suitable property for the essential nature of music.

In *Section IV*, I considered definitions based on the intention of the creator of the sound. I outlined initial problems with the use of intention in a musical definition, namely that intentions are epistemically inaccessible and can be quickly complicated by technology. I concluded that these are merely unattractive features of the use of intention. I then evaluated the issue of intentional entanglement and tried to propose musical definitions with the issue of intentional

entanglement in mind. I concluded that intentional definitions either fail the *intuitive condition* by being *intuition non-conforming* or fail the *functional condition* by being significantly vague.

In *Section V,* I considered definitions based on properties of the listener of the sound. I concluded that these definitions run the risk of failing the *intuitive condition* because they relativize the status of a sound as music to the intuitions of individual listeners.

It is hard for me to imagine that there are any properties of sounds which have not been covered, if at least partially, by the arguments presented in this paper. That is why I have couched many of the arguments in generalities, opting for variables where an actual definition might propose a concrete condition. Of course, it is impossible for me to evaluate every possible musical definition to see why it fails. But while the set of all possible musical definitions might be infinite, the set of all viable musical definitions is finite. It is limited by the conditions spelled out at the outset of this paper; the conditions musical essentialists have committed themselves to. Insofar as the arguments of this paper are exhaustive of the set of all viable answers to the *Strict Definition Project,* and I believe they are, the conclusion we must draw is that the *Strict Definition Project* is unfeasible. There is no non-aesthetic essential nature of music which separates from all other sounds. This entails that if one wishes to talk about music while avoiding the pitfalls of aesthetic evaluation, then one must accept all sounds as music. Independent of aesthetics, the delineation between music and non-music sounds is impossible. Independent of aesthetics, all sounds are music.

This is an explosive proposition. One which reader might find wholly unintuitive. 'If all sounds are music, then no sounds are music!' the incredulous reader might respond. This is a sound concern, one which I would be amiss in failing to provide an explanation for. After all, we have words for 'sound', and we have words for 'music', and we often do not view those words as interchangeable. What then, explains this incongruity between our everyday use of the word 'music', and the logical status of the relationship between music and sound? The reason we hold a strong intuition that sound is different from music, despite the mounting evidence to the contrary, is a common conflation between aesthetic and conceptual claims. That is, there is a common tendency to equivocate a sound's being *bad music* with not being music *at all*. Consider the person frustrated with his neighbor's first forays into learning to play the drums. The frustrated neighbor cries 'why is he making so much noise!' not 'why is he making so much

music!'. The frustrated neighbor sees the sound as non-musical noise, not because it lacks the features of music, but because he finds it aesthetically valueless. The argument of this paper can be seen therefore, as making honest the idea that the distinction between music and non-music is often an aesthetic distinction masquerading as a conceptual one. To reveal this point reveals that the music versus non-music distinctions, despite wishing to proceed with the certainty of conceptual truth, are really founded on claims about aesthetics, and therefore are subject to all the pitfalls claims about aesthetics face. To see furthermore how this the case, consider that a simple aesthetic value-based definition fulfills all the conditions the *Strict Definition Project* is committed to:

*Aesthetically Valuable Sounds*: A sound is music if and only if it has aesthetic value.

This definition is non-trivial. It picks out a subset of sounds as music. It conforms to our general intuitions about what is and is not music. Insofar as it is possible to distinguish things which do not have aesthetic value and things that do, it is functional. The *Strict Definition Project* attempts to find the traits which all aesthetically valuable sounds have in common. But the only thing all aesthetically valuable sounds have in common are 1.) that they are sounds, and 2.) that they have aesthetic value! Insofar as we are defining music without reference to aesthetic value, the only thing we can say all music shares in common is that they are sounds.

To help quell further concerns about this conclusion, consider also that whole of traditional musical culture: norms, conventions, musical heuristics etc. do not need to change as long as they are grounded in aesthetic rather than conceptual claims. 12-tone harmony, musical structure, musical narrative, melody, rhythm etc. can still dominate musical culture as long as their adoption is argued for on aesthetic rather than conceptual grounds. In other words, any conventional techniques can remain a normative standard for the creation of music insofar as it is argued that those techniques are necessary to produce aesthetically valuable sounds. For a proponent of traditional musical techniques; melody, harmony, rhythm etc. this picture can be illuminating. No longer must these techniques be justified by appealing to abstract concepts such as the 'essence of music'. Rather they can be justified on purely practical grounds. It can be argued instead that melody, harmony, or rhythm (or any other musical technique) are useful because they produce the most aesthetically valuable sounds.

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