Are there musical constraints on musical creativity?

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The question posed in the title may strike some as peculiar and misdirected. How can there be musical constraints on musical creativity, when creativity by definition involves novelty and therefore the necessity of going beyond pre-existing patterns and the standards they embody? Consideration of such issues in the domain of music has traditionally been hampered by the lack of a generally accepted and substantial definition of music itself, but an analogy from the domain of language may help clarify the nature of the question. A given language employs a limited set of some forty phonemes to compose the vastly larger stock of words that make up its lexicon, and these words, or more strictly speaking, their constituent morphemes, in turn are used to compose the potentially infinite set of meaning-bearing sentences that may be generated with the help of the grammatical conventions of the language. A creative speaker of that language may on occasion violate the rules of that grammar to good creative effect, but it would be peculiar to claim that linguistic creativity demanded the wholesale abandonment of that grammar altogether, or dispensing with the use of the set of phonemes it employs. There are forms of oral creativity that do this, exemplified by phenomena such as "speaking in tongues", but these are better regarded as extra-linguistic forms of human creativity than linguistic ones. The reason we have little difficulty making such judgements in the case of language is the already mentioned infinite potential for generating linguistic expressions inherent in the combinatorial powers of its grammar. The conventions of language open up a limitless field for linguistic creativity on the basis of its very small set of elements. In some sense, therefore, the mark of linguistic creativity is what is achieved by applying those conventions in novel ways. Without them comprehensibility is compromised, and with that, the domain of language proper is abandoned.

Recently it has been proposed that a deep parallelism exists between music and language in the sense that both systems are ultimately founded on the "particulate principle of self-diversifying systems" (Merker, 2002) as defined by William Abler (1989; see also Studdert-Kennedy, 1998). In brief, when members of a finite (usually small) set of discrete and non-blending particulates, such as atoms or phonemes, are combined they give rise to qualitatively new distinctive patterns which in turn can be combined, generating potentially infinite pattern variety in the process, as in chemistry, genetics and language. Abler called these systems Humboldt systems after Wilhelm von Humboldt's comments on human language in these terms. Music was mentioned only in passing by Abler, but it provides a striking illustration of such a system by basing its pattern variety on a discretization of the frequency/pitch continuum into musical notes forming "pitch sets", and, in all rhythmic or "measured" music (Arom, 1991), on a discretization of the time continuum into sets of discrete durations with proportional values based on the musical pulse or "tactus." This orthogonal discretization of spectro-temporal space places a radical reduction of degrees of freedom at the origin of the generative principles of music, allowing music, like language, to achieve infinite pattern diversity by finite means. A detailed discussion of the particulate nature of music and its consequences can be found in Merker (2002).
The identification of music as a Humboldt system is germane to the issue of musical creativity in that the key to its infinite generativity is the very reduction of degrees of freedom that lies at the origin of its self-diversifying potential. It is by this radical reduction that music conquers for itself the discrete, particulate nature of the elements whose combinatorics then open the door to the infinite universe of music as a Humboldt system. In these terms, pattern richness as such is not the crucial mark of music: it would be dwarfed in this respect by the output of a multidimensional sound randomizer. Rather it is the feat of attaining to infinite pattern richness on the basis of a finite set of elements which lends it the distinction of a Humboldt system. This is no mere matter of the prestige attendant on membership in an exclusive club: this same finitude of elements supplies a good part of the essential conditions for the discriminability, learnability, memorability and reproducibility of musical patterns, factors with a profound influence on the emergence and survival of musical forms as cultural objects (for details, see Merker, 2002).

The above considerations allow us to define the medium of music not as "sound" or even "organized sound" - which does not distinguish music from speech, for example - but as that discretization of spectro-temporal space which yields pitch sets and proportional durations as elements of musical creativity, analogously to the way phonemes supply the combinatorial elements and medium of language. More specifically, music may be characterized as that mode of expressive creativity whose defining structural content is a product of the operation of the particulate principle on orthogonally discretised spectro-temporal space in such a manner as to achieve open-ended self-diversification in cultural history. On these grounds, the particulate principle guarantees infinite scope for musical creativity while at the same time lending it structural characteristics predisposing it to an active role in cultural history through the disambiguating power of particulate pattern formation.

In these terms, then, the question of whether there are musical constraints on musical creativity may be answered in the affirmative: music is music by virtue of the discretizing constraints that provide it with limitless scope for self-diversification through the operation of the particulate principle. With that it becomes possible to define extra-musical forms of creativity that exploit the possibilities of spectro-temporal space in other ways than music does. We have already mentioned speech which does so on the basis of its small sets of phonemic articulatory gestures and, like music, does so on the basis of the particulate principle. Human ingenuity is, however, not limited to exercises in particulate combinatorics: it is possible to work creatively in the medium of sound directly, without the initial reduction of degrees of freedom that makes music a particulate system. The possibilities of such creativity have been drastically enhanced by modern electronic means for storing and modifying sound, and have been under active exploration by artists with a wide range of orientations and techniques for the better part of a century. Some of these have started referring to their discipline as "soundart" ("Klangkunst" in German), a most appropriate term from the present perspective.
It is to be noted, finally, that the particulate principle can help define only the universe of pattern possibilities within which the realised patterns of extant musical forms develop, but not the closer determination of the patterns that constitute any given musical genre or tradition in cultural history. It thus supplies a highly abstract constraint on musical creativity. On the one hand this means that it does not dictate the nature of the patterns that are created by its means, and on the other it means that it gives the creative musician little guidance regarding pattern specifics in the creative process. It simply points to the nature of the raw materials with the help of which the creative imagination may exercise its powers in the domain of music, an exercise on which factors of musical history, culture and context exercise far more concrete constraints than the particulate nature of music does.

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