Perception and Critique: Ecological Acoustics, Critical Theory and Music

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Abstract

Cognitive theory as applied to music has regarded the meaning, critical content or ideological ‘value’ of music as too rarified and abstract, and too remote from empirically verifiable properties, to figure in its account of music perception. Ecological perceptual theory, however, offers a framework within which the directness and immediacy of these attributes can be understood, and a link with such apparently distant domains as critical theory and aesthetics established. Following an outline of how such a theory might work, a brief perceptually-motivated analysis of “Strugglin’” by Tricky is offered as an example of how a different approach to perception may make the connection with the meaning and critical impact of music more obvious.

1 Cognitive Music Theory

Over the past 15 years or so, a good deal of progress has been made in bringing the psychology of music and music theory closer together. Lerdahl and Jackendoff’s Generative Theory of Tonal Music from 1983 is perhaps the most striking example of this, but others too have had an impact (e.g. Meyer, 1956; Krumhansl, 1990; Narmour, 1990), and are symptomatic of a desire that music theory should be relevant to listening, and that work in music perception should engage with the preoccupations of musicians and music theorists. There still remains, however, a considerable gulf between psychological accounts of our response to music, and those offered within aesthetics and critical theory - though there is arguably greater potential common ground between these two domains than between the psychology of music and music theory. There have been various responses to this: one has been mutual suspicion and rejection, with the music perception community dismissing aesthetics and critical theory as hopelessly rarified and unrealistic, preoccupied with the elaboration of its own hermetic discourse and unrelated to the facts of listening; and the aesthetic and critical community rejecting the simplistic, ahistorical and reductionist character of the psychology of music, and its lack of relevance to the sophisticated sensitivities of engaged and enculturated listeners: “Music recognizes no natural law; therefore, all psychology of music is questionable.” (Adorno, 1973: 32). Another response from the music perception community has been ‘not yet’: before we can deal with the highest levels of musical response we need to sort out some of the basic processes. “To approach any of the subtleties of musical affect, we assume, requires a better understanding of musical structure. In restricting ourselves to structural considerations, we do not mean to deny the importance of affect in one’s experience of music. Rather we hope to provide a steppingstone toward a more interesting account of affect than can at present be envisioned.” (Lerdahl & Jackendoff 1983:

8). And from outside the music perception community, there have been attempts to integrate, or graft on, bits of cognitive theory with philosophical aesthetics (e.g. DeBellis, 1995). None of these can really be regarded as having made much progress in bridging the gap - a gap which admittedly is regarded as inherently unbridgeable by some. The position I adopt in this paper is that the failure to make any progress can be attributed to an assumption that the cultural, aesthetic or ideological value of music is more remote than its basic perceptual properties. It is that assumption that I will challenge, along with the approach to perception on which it is based.

With a few exceptions, the overwhelming majority of work in the music perception literature can be crudely classified as adopting a cognitive approach. Simplifying enormously, a fundamental principle in this approach is that perception has a sequential character, starting with basic perceptual attributes (such as pitch, temporal grouping, timbre, spatial location etc.) which are processed faster and with substantial or complete commonality between different individuals, and proceeding through successively more complex and abstract levels of processing, which become more idiosyncratic to the specific training and experience of an individual listener. Thus the ‘cultural meaning’ of a piece of music, which is regarded as being at the remotest level of this sequence, is conceived of as being the most personal, idiosyncratic and unpredictable (or even inexplicable) aspect of the whole experience, while the basic perceptual attributes are a more tractable proposition for empirical and theoretical accounts.

A variety of kinds of evidence are offered in support of this view: speed of processing (a simple decision task on a basic perceptual attribute will be made faster than on a more ‘complex’ attribute), developmental sequence (children seem to acquire a sensitivity to simple perceptual attributes before more complex attributes), and inter-subjective stability (judgements of basic features such as the grouping of events typically show much more agreement between
subjects than do judgements of music’s ‘semantic content’, for example). The empirical truth of these findings, however, does not necessarily entail the interpretation provided by cognitive theory, and furthermore in an enculturated adult, developmental sequence or relatively small differences in speed of processing may be of little or no consequence for perceptual experience. The view taken in this paper is that whatever the ‘flow of information’, in effect more ‘abstract’ levels are just as directly available (and paradoxically possibly even more so) as are those regarded as basic and primary.

### 2 Ecological Perceptual Theory

An alternative view of perception and cognition has existed for the best part of 50 years, has been almost completely ignored by the psychology of music, but offers a radically different and extremely fruitful outlook. This is the perceptual theory of J. J. Gibson, often referred to as an ecological or direct realist approach. For the purposes of this paper, I will focus on three fundamental principles from ecological theory: i) stimulus information is highly structured and specifies its source directly; ii) source specification is an aspect of meaning - perceptual meaning; iii) while ecological theory appears primarily oriented to the perception of the natural environment, there is no sharp discontinuity between nature and culture, and the manner in which cultural meanings are available to a perceiver is no different from the way in which natural meanings are. Gibson himself pointed out that culture is as dependent on material reality as is the natural environment, and that our response to the cultural environment is similarly dependent on the ability to pick up perceptual information: “Symbols are taken to be profoundly different from things. But let us be clear about this. There have to be modes of stimulation, or ways of conveying information, for any individual to perceive anything, however abstract. He must be sensitive to stimuli no matter how universal or fine-spun the thing he apprehends. No symbol exists except as it is realized in sound, projected light, mechanical contact, or the like. All knowledge rests on sensitivity.” (Gibson, 1966, p. 26).

Gibson developed these ideas primarily in relation to vision, and there has been only a rather slow attempt to apply the principles to hearing, and music in particular (though see e.g. Bregman, 1990; Dowling & Harwood, 1986; Windsor, 1995). A great deal stands to be gained by doing so, however, particularly in bringing some kind of continuity and unity to the way in which we understand the perception of ‘basic’ features and the cultural meanings of sounds. The ecological approach asserts that the source of a sound is directly specified in the stimulus information as it arrives at the sensory system of a perceiver: the spatial location, the material (specified in the frequency relations that we identify as timbre), the mode of excitation (specified in features such as the attack characteristics), its separation from other sources (specified in the dependence or independence of behaviour of frequency components, vibrato, dynamic variation, etc.), and so on. Bregman (1990) gives a thorough and comprehensive account of this aspect of auditory and musical perception from a broadly ecological perspective. But the principle can be, and has been, extended into far more apparently rarified areas. Windsor (1995) has pointed out that just as sounds specify directly the invariants of the natural environment, so too do they specify the constancies (in fact we can call them ‘invariants’) of the cultural environment. The resistance to taking this step has been twofold: i) higher level properties of music (such as tonality and metre, for example) are held to be mental constructs rather properties of the material itself; ii) cultural meaning has, with the influence of linguistics and semiotics, been theorised as based on arbitrary codes, and thus subject to constant and arbitrary change. Both assumptions are unnecessary. The tonality or metre of a piece of music is as much a property of that music (in relation to a perceiver) as is the identity of the physical instrument(s) playing it - and is as shared with all the other music that shares the tonality or metre as is the instrumental commonality of all the other music played by the same instrument(s). Tonality can be regarded as directly specified in sounds (though obviously distributed over time) in just the same way that the roughness of two pieces of sandpaper rubbed together is specified in the acoustical information. Similarly, although it is true that the coding of a cultural unit with its conventional meaning is arbitrary (in the sense of not being determined by the form or substance of the signifier) and thus potentially infinitely changeable, the reality is that once that cultural unit is embedded within a system of any complexity, its meaning is effectively as invariant as a natural law. It is quite possible in theory to decide that the signifier <<tuba>> will from now on mean (i.e. denote the concept) ‘violin’, but essentially impossible in practice to effect such a change, given the weight of human culture. Thus <<tuba>> means ‘tuba’ for a particular cultural community with about the same degree of flexibility that the acoustical information broadcast by the slamming of a car door specifies just that - a car door slamming.

### 3 An Example

From this theoretical base let me present a brief musical example which illustrates how the view proposed here might be used. The example is a piece of studio music called “Strugglin’” by the British musician Tricky and his collaborators (which can be heard on the CD entitled “Maxinquaye” - BRCDD 610/524 089-2), and belongs to a genre which has been called “trip-hop” - referring to its combination of hip-hop and dreamy/psychedelic/surreal elements. The piece lasts for just over six and a half minutes, and although constructed out of unusual materials for this genre, is quite straightforward in terms of its overall formal structure: an introduction followed by three verse/chorus alternations, and then a rather extended ‘coda’ which lasts for nearly half the track.
Although there is the serious risk of offering too ‘pat’ an interpretation of this music, I am going to argue that in an obvious reflection of its title the track directly specifies ‘struggle’ or uncertainty of various kinds. First, at the level of sound objects, or what Bregman (1990) has called the auditory scene, there is uncertainty about what the sources of some of the sounds are, and in some cases considerable deliberate disruption of the integrity of the sound. The track starts with a mixture of instrumental and real world sounds organised so that they at first appear to have an almost arbitrary and simply ‘layered’ relationship to one another: the sound of a cough or laugh with a great deal or reverb, a guitar-like drone sound in parallel fifths that slides up through a major second, the sounds of creaking and dripping. Tricky’s voice recorded quite far back in the texture talking and mumbling in a semi-audible and semi-comprehensible manner, a gun being loaded, a kind of wobbling/oscillating sound that could be either instrumental or the sound of a machine, dense and granular sounds that seem to specify industrial processes, a screech that might be an instrument, and a siren that breaks off and re-starts with the disruption of the introductory process, a kind of arbitrariness to the way the track adds. Within the domain of the sounds themselves, uncertainty or struggle are specified directly in the instability of the sound objects at their most physical level.

Turning now to musical structures and genres there are again struggles, clashes or uncertainties of various kinds. The materials are presented within a verse/chorus framework as is conventional for much music within this genre, but the framework itself is an object of uncertainty. Material that appears at the start, and which appears to be part of the introductory section, later seems to be contained within the frame of the first two verses (because it is repeated), only to disappear in the third verse. Similarly the long coda, made up as it is of the same elements as the verses and choruses, undoes their identity through a kind of rambling extension. And what kind of music is this? It is presented as dance music, and emerges from and belongs to dance culture, but is too slow and disrupted for anyone actually to want to dance to it. The clichéd rhythm from the drum kit is at a grinding tempo as if produced against overwhelming inertia, and struggles to retain its own rhythmic identity at this deadening pace. Tricky himself comes from a rap background, and there are obvious elements of rap in the rhyming couplets, the spoken delivery, and the style of the textual material, but again it is all ‘undone’ by the tempo, the rhythmic waywardness of the delivery and its juxtaposition and interaction with a female vocalist whose music seems to inhabit an utterly different musical context. Once again, then, these musical uncertainties, clashes and contradictions are directly specified by features of the stimulus information itself.

Finally the ideological or cultural ‘value’ of this music. Hip hop and rap have a particular ideological and cultural content, a significant part of which comes from the fact that they are components of a predominantly black culture within Britain, but here we hear these cultural values with distinctive traces of a West of England accent (from where Tricky comes). Drug use and sanity/insanity are clearly ‘topics’ for this music not only as expressed through explicit verbal content, but also in the character and nature (laughter, confusion, mumbling delivery) of Tricky’s vocal style. The elements of this apparently most abstract component of the music’s perceptual meaning are thus seen to be as directly inscribed in the stimulus information itself as any other. The difficulty is not to demonstrate the materiality of music’s critical potential, but rather the danger of attributing determinant meanings where radical multivalence is of the essence, or of treating music material as if it were a vehicle for meaning rather than a species of meaning itself.

As I have tried to argue here, the meaning and critical value of this music (and I acknowledge that the same perceptual information can specify different meanings to different audiences - a quite explicit aspect of the dualism that is inherent in an ecological view) are directly specified in a number of domains simultaneously, and all with the same directness and immediacy. Culture and ideology - which are those aspects of meaning of which listeners are primarily aware - are just as material (in the concreteness of the practices in which they are embodied) as are the sound sources that are used to generate this music, and as perceptual sources they are just as much a part of the environment.

4 Summary, Prospects, Critique

This paper has proposed that while aesthetics and critical theory on the one hand, and the psychology of music on the other, may have different aims, there is scope for a more fruitful dialogue between them than has been witnessed for most of the period of the ‘modern’ psychology of music. The ecological approach to perception, and its espousal of a form of direct realism, offers one way to develop such a dialogue by proposing a theory which draws together the perception of supposedly basic properties and supposedly abstract characteristics. By emphasising the fundamental importance of perceptual information, and the manner in which perceptual information specifies sources (ranging from physical sources to cultural systems) the perceptual immediacy and materiality of what have previously been regarded as completely divergent qualities of music are underlined. It is remarkable that while the psychology of perception and critical theory have commonly been regarded as being poles apart, the direct realist approach brings them into close proximity. When Adorno writes that “What an artist has to say is said through figuration; it is never a message carried by figuration” (Adorno, 1984: 216), he expresses the materiality of music’s critical content,
just as Gibson (see above) emphasises the concreteness of both nature and culture.

The brief analysis presented here might justly be criticised for dealing with the music concerned in a manner that is no less simplistic than that offered by more standard cognitive accounts. It is impossible within the confines of a paper such as this to demonstrate anything more than the broad outlines of the approach. Two indicators, however, point to the potential of such an approach: first, more detailed analyses based on the same or similar principles exist (e.g. Windsor, 1995 - who deals with the perception and analysis of acousmatic music) which show something of the scope of the approach; second, even in the cursory analyses contained within this paper, a much broader and more diverse range of attributes is tackled than is usual, encompassing issues that have conventionally been regarded as beyond the bounds of music perception.

The issue is not just one of theory (psychological, musical, or cultural) and analysis, however. As far as empirical investigation is concerned, a crucial question becomes “What are the invariants that specify....?” - and this can be ‘aimed’ at a whole variety of levels - from motifs to ideologies. Note also that this is perfectly consistent with a great deal of existing work in music perception - particularly the kind of research in auditory scene analysis (Bregman, 1990) which is explicitly influenced by ecological acoustics. It does, however, radically change the emphasis from internal processes to external realities. Gibson used the term ‘resonance’ to describe the relationship of the perceiver to stimulus information, emphasising the idea that perception is not a question of developing a battery of internal processes that sort out information and generate representations, but is a matter of becoming sensitive or attuned to properties of the environment which have material reality. The danger with the term resonance is that it implies passivity, as though perceivers are somehow magically endowed with the capacity to ‘resonate’ to the appropriate information. Nothing could be further from the truth: ecological theory is committed to the principle that perceivers explore the environment actively and that this active exploration not only shapes and ‘fine tunes’ resonance - but actually constitutes the relationship itself. Even in a passive and simplified manner, contemporary connectionism has provided a glimpse of how this kind of interaction can work. Although it is an enormously over-simplified view of either the mind or the brain, it nonetheless demonstrates in a concrete manner how a system that does not make use of representations, but is shaped by exposure to a structured environment, can behave in a complex and interesting manner.

Finally, a remark on the application of these ideas to different kinds of music. The continuity that the ecological approach brings to an understanding of how we hear real world sounds and musical events means that application of the theory to music with real world references of one kind or another seems an obvious first step (and a whole variety of types of acousmatic music - of which the example in this paper is one - are one obvious target). But what of the so-called ‘autonomous’

References