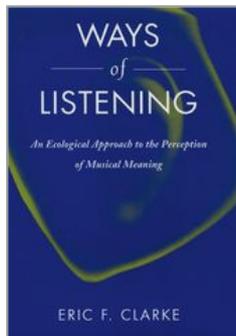


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Ways of Listening: An Ecological Approach to the Perception of Musical Meaning

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Introduction

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Abstract and Keywords

This introductory chapter sets out the basic framework for the book, imagining the ways in which a person might perceive and interpret the meaning of some sounds recorded onto an unlabelled CD. It goes on to present the book's basic perspective on music and ecological theory; the relationship between listening and meaning; the relationship between psychology and musicology; the musical repertoires and cultures considered; and the book's relationship to music history. The chapter concludes with a critical discussion of the information processing approach to music perception.

Keywords: ecological theory, sounds, meaning, information processing, perception, musicology

Imagine that you are tidying your desk and come across an unlabeled CD. Not knowing what it is (it could be a backup

disk, some student work, a CD of sound examples) you put it into your CD player and press the play button. The first track starts with a kind of blustery, rustly, crackly sound—hard to recognize to begin with—and then clearly the sound of someone eating crisps. This must be some studio project belonging to a student, you think, and curious to discover what else is on it (now that you know that it is audio and not data!) you skip to the next track—which starts with African percussion sounds over a jazzy bass line and what sounds like a sampled mbira. This is definitely someone else's CD, so you press stop, eject the CD and wonder who it belongs to and how to get it back to its rightful owner.

This brief imagined example illustrates some of the themes concerning sound, music, perception, and meaning that run through this book. First, it illustrates how the primary function of auditory perception is to discover what sounds are the sound *of*, and what to do about them: these are the sounds of someone else's CD, and you need to find a way to get it back to that person. Second, it suggests that when you hear what sounds are the sounds of, you then have some understanding of what those sounds mean: the recorded (p.4) sounds of someone eating crisps and of African-influenced worldbeat music are in this case the sounds of someone else's CD. Third, it shows that sounds are often the sounds of all kinds of things at the same time: the first track of this imagined CD presents the sounds of crackly cellophane packaging (or is it blustery wind on the microphone?), and crisps being eaten (or is it celery? or the crunching of leaves?), and location recording, and student work; the second track is the sound of pop music, and of a sampled mbira (or is it a marimba?), and of the influence of jazz, and of a European idea of 'the sound of Africa.'

My imagined scenario also illustrates the way in which musical sounds take place in a wider context of other sounds. The tidying up that uncovered this mystery CD would have generated all kinds of rustling and shuffling sounds as papers and other objects were moved around, and perhaps a clatter or thump as something fell to the floor and you looked down to retrieve it: it is in this context that the sounds of the CD are heard. If, not knowing what was on the CD, you half expected

the chaotic electronic noises that you get when you try to play a data CD, then the crackly sounds of cellophane packaging being opened at the start of the first track might be momentarily disorienting. Are they on the CD or caused by something in the room? Musical sounds inhabit the same world as other sounds, and while the majority of writing on music, and music perception, has tended to cordon off music from the rest of the acoustical environment, it is self evident that we listen to the sounds of music with the same perceptual systems that we use for all sound.¹

Many previous approaches to musical meaning have adopted either a linguistic or a more generally semiotic perspective, rather than the perceptual approach that I adopt here. The subtitle of this book declares that it is an ecological approach to the perception of musical meaning. What do I mean by the perception of musical meaning, and what is an ecological approach? Perception is the awareness of, and continuous adaptation to, the environment, and, on the basis of that general definition, the perception of musical meaning is therefore the awareness of meaning in music while listening (p.5) to it. It can be distinguished from musical meaning that arises out of thinking about music, or reflecting on music, when not directly auditorily engaged with music. Under those circumstances music is imagined or recalled, rather than perceived, since nothing is going on in the peripheral auditory system (the outer, middle and inner ear).² Ecology is the study of organisms in relation to their environment, and the approach to perception presented in this book is characterized as ecological because it takes as its central principle the relationship between a perceiver and its environment. While there is a biological thread running through the book—in terms of ecology and adaptation, and a concern with the organism and its environment—I do not attempt to describe or explain the structure or function of the auditory system. Other books already do that authoritatively (e.g. Handel, 1989; Moore, 1997). My main aim is to discuss the ways in which listeners interact with the general auditory, and more specifically musical, environment: to discuss listening to music as the continuous awareness of meaning, by considering musical materials in relation to perceptual capacities.

The totality of “music,” in even just one culture or subculture, is a large and complex web of phenomena, but this book will deal almost exclusively with the sound component of music. This concentration on sound comes not from a belief that the “essence” of music is sound, but from a recognition that sound is a component of all musical cultures, and that despite extensive writing in music theory, aesthetics, and the psychology of music, there is still a fragmented and contradictory understanding of what listening to music “feels like,” and of how that experience might be understood and explained.

Music and Ecological Theory

The aim of this book is to understand music in the light of the ecological perceptual theory proposed by James Gibson (e.g. 1966; 1979) and others (see Heft 2001). Perhaps because of his own (p.6) progressive deafness, Gibson developed his ideas much less in relation to auditory perception than vision, and made only the most cursory reference to music. Since Gibson's death in 1979, however, others have explored the potential of an ecological approach, first in relation to auditory perception in general, and more recently in relation to music. Vanderveer's doctoral thesis (Vanderveer 1979) is an important starting point, as are studies by Warren and Verbrugge (1984) and Gaver (1993a; 1993b). Two influential books (Handel 1989; Bregman 1990) also applied certain aspects of the ecological approach to auditory perception, both of which featured some discussion of music. Bregman's *Auditory Scene Analysis* in particular has been regarded as a landmark in the study of auditory perception, though neither Handel nor Bregman adopt a wholly ecological outlook.³

In the last twenty years, however, there have been various attempts to apply ecological perceptual theory to music in different ways.⁴ The most comprehensive body of work in this respect has been that of Windsor, who in a series of publications (Windsor 1994; 1995; 1996a; 1996b; 1997; 2000; 2004) has discussed a whole variety of attributes of acousmatic music (that is, music presented over loudspeakers or headphones) from an ecological perspective, as well as

more generally considering the relationship between ecology and semiotics. Finally, although not explicitly within an ecological framework, two electroacoustic composers, Dennis Smalley (1986; 1992; 1997) and John Young (1996), have written a number of important articles which discuss acousmatic music from a perspective that has significant commonalities with the approach developed by Windsor and with the ecological approach as a whole.

Listening and Meaning

In ecological theory, perception and meaning are closely related. When people perceive what is happening around them, they are (p.7) trying to understand, and adapt to, what is going on. In this sense they are engaged with the meanings of the events in their environment. As I explore further in the next chapter, to hear a sound and recognize what it is (for example the sound of the mail being delivered through the letterbox) is to understand its perceptual meaning, which will result in corresponding actions. By contrast, to hear a sound and *not* recognize what it is, is to fail to understand its meanings and thus to act appropriately. For example, if I hear a regular sound from my back wheel as I cycle along and don't recognize that it is made by a bulge in the tyre rubbing against the frame, then I will fail to understand what it means and that I need to stop and do something about it. Similarly, if at a concert I hear some sounds that I identify as leading up to the final cadence of a tonal piece of music, I understand an aspect of their meaning (final closure) and can prepare myself for the applause that will follow. By contrast, if I hear some sounds and fail to recognize them as pre-performance tuning, I will fail to understand that the “music proper” has not yet begun.

This view of meaning, closely tied to perception and action, is somewhat different from the many views of musical meaning that have been proposed within the frameworks of philosophical aesthetics (e.g. Kivy 1990; Davies 1994; Scruton 1997), phenomenology (e.g. Clifton 1983), semiotics (e.g. Nattiez 1990; Agawu 1991; Monelle 1992, 2000; Hatten 1994; Tarasti 1994), hermeneutics (e.g. Kramer 2001; 2003),

multimedia (e.g. Cook 1998a; 2002), and social theory (e.g. Green 1988; Small 1998; DeNora 2000). Although all these authors give some consideration to the experience of hearing musical sounds, none of them is primarily concerned with explaining how that experience comes about. Most writers on the subject assume that sounds are picked up in one way or another, form basic units of some kind (notes, motifs, melodies, textures, etc.), and are organized into structures, but that the perceptual processes involved play little or no role in a theory of musical meaning. The explanation of meaning is to be found elsewhere—in theories of expression, semiotics, or social construction, (p.8) for instance. By contrast, listening occupies a central position throughout this book, based on the proposition that the experience of musical meaning is fundamentally—though not exclusively—a perceptual experience. There is of course meaning in remembered and imagined music, and even in music that a person has read or heard *about* but never actually *heard*, but since none of these experiences involve any active engagement with the auditory environment, this is not perceptual meaning.

Psychology and Musicology

My approach addresses the perception of musical meaning from psychological and broadly musicological perspectives. On the one hand I argue the case for the explanatory power of certain general perceptual principles that apply to all human beings; and on the other hand I look at the particular consequences of those principles in contexts that are historically and culturally specific. As the outline of the book makes clear (discussed below), some chapters offer explanations, while others raise questions and explore consequences.

Since the 1980s, a partial convergence between the psychology of music and musicology has taken place (see also Clarke 2003 for a discussion). Some musicologists have adopted perceptual principles in their consideration of musical material and listeners' engagement with that material (e.g. Lerdahl and Jackendoff 1983; Cook 1990; Nattiez 1990; Cumming 2000; or, at an earlier stage, Meyer 1956), and some psychologists have not only accepted music as a legitimate

domain in which to do research but have also tried to integrate the cultural and historical condition of musical materials into psychological research (e.g. Krumhansl 1995; 1998). Nonetheless, psychology and musicology have rather different basic agendas: psychology as a (social) science is fundamentally concerned with general principles of human behavior and mental life, understood from a contemporary perspective, and with an eye to “timeless (p.9) laws,” while musicology is more closely focused on particular manifestations, understood in their historical and cultural specificity, and with a strong sense of the provisional and shifting nature of that understanding. Since these differences have sometimes led to a degree of mutual frustration or incomprehension, I hope to show that the two disciplines can be combined in a fruitful and stimulating manner.

History, Repertory, and Cultures

My primary focus is contemporary listening—the experiences of listeners at the start of the twenty-first century. But those listening attitudes and practices did not just appear from nowhere: they have their own history and have come about by means of a historical process that continues to exert its influence. Understanding the perception of musical meaning therefore involves a historical dimension that surfaces in different ways, and to differing extents, in the chapters that follow. In a similarly heterogeneous way, I deal with a mixture of Western art music, and pop music, in order to show that the ideas apply equally well (though perhaps in different ways) to a variety of musical styles and traditions—to score-based and studio-based music, to instruments and to voices, to “absolute” music and to music with texts, to “art” music and to pop. The repertory does not extend beyond a subset of Western traditions, however, since that is where my experience and expertise lie. Nonetheless there is evidence that the ideas discussed here apply in interesting ways to other musical traditions (see Baily 1996). Indeed many aspects of ethnomusicological theory, with its attention to the relationships between musical practices and their cultural and natural environments, and the close relationship between perception, knowledge, and action in the study of musical cultures, are not only consistent with an ecological view but in

some cases engage with it quite explicitly (e.g. Clayton 2001; Feld 1994).

(p.10) The overall plan of the book moves from a predominantly scientific to a predominantly cultural perspective. Chapter 1 presents the theoretical principles on which most of the rest of the book is based—James Gibson's ecological approach to perception and developments of that theory in relation to sound and music. An important part of this discussion is a consideration of the relationship between nature and culture in perception, and specifically of the perception of “everyday” and “musical” sounds. Chapter 2 is an illustration of the way in which the theory proposed in chapter 1 might apply to a rather more extended musical example than the “sound clips” that have been featured so far: Jimi Hendrix's performance of “The Star Spangled Banner” recorded at Woodstock in 1969. In my analysis I attempt to show how different attributes of the perceived meaning of this music—relating to sound, structure, and ideology—coexist and are simultaneously available.

Chapters 3 and 4 address different aspects of the experience of subjectivity in music. Chapter 3 looks at the way in which motion and agency are perceived in music, and the consequences of this for a listener's sense of subjective engagement with musical materials. Chapter 3 examines the ways in which music influences or determines a particular listening attitude, or “subject-position,” in relation to its material. Part of a listener's experience of music is the manner in which he or she is invited to engage with the “subject matter” of the music—seriously, ironically, authentically, in an alienated manner, with disbelief or humor. An analysis of two pop songs shows how this can be understood when the subject matter is substantially defined by textual content, and shorter analyses of instrumental music show how similar principles might apply in the absence of text.

Much of the music discussed in the book up to this point is either closely associated with texts or drama or has a well-defined social function. Chapter 4 considers the so-called absolute and autonomous music of the Western art music

tradition, and autonomous or structural listening, in the light of ecological perceptual (p.11) theory. Despite the apparent incompatibility between ecology and autonomy, I argue that ecological theory can shed light on the perceptual meaning of music from this tradition too. Chapter 5 demonstrates this with a perceptual analysis of a piece that is firmly within this absolute and autonomous tradition: the first movement of Beethoven's String Quartet in A minor, Op. 132. Finally, the conclusion brings together the themes of the book and addresses once again the relationship between perception and action in music, and the opportunities, values, and functions that music presents to a listener.

Music Perception, Information Processing, and Ecological Psychology

Consider once again the sounds from the unlabeled CD with which this chapter began, and the various ways in which you might hear them: as someone eating crisps, or perhaps celery, or walking on dry leaves; as friable objects being broken and pulverised; as a collection of semi-regular noise bursts with a predominance of high frequencies and no clear sinusoidal components; and so on. Taken together, these various possible responses seem to suggest that the sounds of the world reach our ears in a very indeterminate raw state, and that individual perceivers then make sense of them according to a whole range of factors: the specific context of the sounds, what the listeners were hearing most recently, differences in how they focus on the sounds, their previous experience or training, and so on—in short a whole variety of “processing” differences largely based on mental representations or memory processes of one sort or another. This is, broadly speaking, what might be called an “information-processing” approach to perception, and, from the 1970s until recently, it has been the dominant approach in music perception, as well as auditory perception and perceptual psychology more generally. My purpose here is to give a brief account of the information-processing approach, to point out (p.12) some of its theoretical limitations, and then to consider the alternative offered by ecological theory.

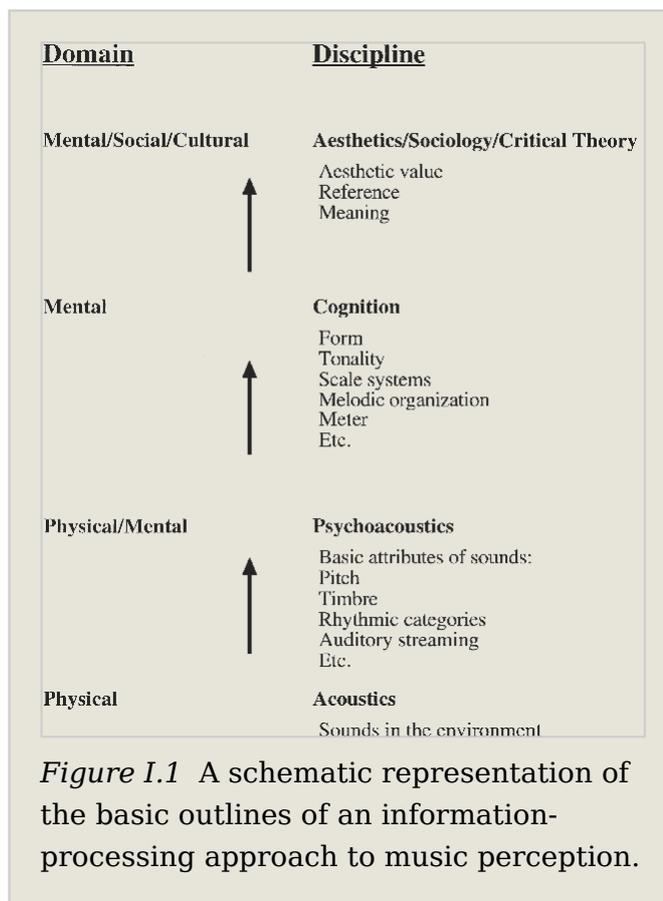
A general outline of the information-processing view is as follows. In William James's famous phrase, the environment is

regarded as a “blooming buzzing confusion” (James 1892: 16) —as a maelstrom of sensory stimulation which perceiving organisms organize and interpret with the processes and structures of their perceptual and cognitive apparatus. In other words, structure is not in the environment: it is imposed on an unordered or highly complex world by perceivers. This is a simplified and rather polarized version of the information-processing outlook, but in a variety of ways it has had a profound impact on the way in which the perception of music has been approached. Perhaps the most obvious influence is the almost ubiquitous conception of music perception as a set of stages or levels, proceeding from simpler and more stimulus-bound properties through to more complex and abstract characteristics that are less closely tied to the stimulus and are more the expression of general cognitive schemata and cultural conventions. Figure I.1 schematically represents this progression.

The ubiquity of this view can be seen in the way in which studies of music perception nearly always proceed from psychoacoustics (studies of the relationship between the physical properties of stimuli and their perceptual counterparts) to more cognitive studies (the organization of these primary psychoacoustical properties into more elaborated structures such as motifs and rhythmic groups), and finally to the abstract structures of larger stretches of music. In a book widely regarded as a primary reference volume on the psychology of music, the editor of the volume states:

In this chapter we shall examine ways in which pitch combinations are abstracted by the perceptual system. First we shall enquire into the types of abstraction that give rise to the perception of local features, such as intervals, chords, and pitch classes.... Other low-level abstractions result in (p.13)

the



perception of global features, such as contour. Next we shall consider how combinations of features are abstracted so as to give rise to perceptual equivalences and similarities. We shall then examine how these higher-level abstractions are themselves combined according to various rules. (Deutsch 1999: 349)

(p.14) The top of this pyramid of processing (which is arguably the goal of the whole sequence of processes), though often rather poorly defined or described, can be conceived as conscious or unconscious experiences of some kind which may or may not be expressible as named events or actions (“someone playing slide guitar,” “the opening of the Rite of Spring,” “a nursery rhyme in G major”).

Information-processing accounts recognize that the flow of information is not unidirectional: as higher level interpretations emerge, they influence the processing of new information (a mechanism known as top-down, or concept-

driven, processing) just as new information has the capacity to overturn or modify an emerging interpretation with which it conflicts (bottom-up, or data-driven, processing). Indeed top-down processing starts before the interpretation of any specific events has even got under way, since perception is always influenced and informed by whatever was happening immediately beforehand, as well as by more generalized preconceptions and expectations derived from previous experience. The variables of top-down processing therefore provide a clear and straightforward way in which to account for particular individuals' differing interpretations: differences in mind-set when a stimulus is encountered can feed down through a number of levels of processing and cause individuals to arrive at different outcomes. Equally, if the stimulus material itself is weakly or ambiguously structured, even a small difference of emphasis at some stage in processing might be enough for distinct processing paths to be followed from there on up through the system. Differences of this kind are offered as explanations for the multiple interpretations of visual and auditory illusions, or of poorly structured but suggestive arrays such as the Rorschach "inkblot" test, or acoustic collages (in which listeners may be quite convinced that they can hear all kinds of things that are not there).

The information-processing approach has a number of positive attributes: it offers a clearly structured route from simple to complex properties; it is consistent with the hierarchy of processing stages used in many computational approaches (feature extraction (p.15) of one kind or another, or hierarchical pattern matching) but nonetheless avoids being too deterministic, by virtue of the interaction of top-down and bottom-up processing; and it reflects an assumption, or belief, that listeners are more immediately aware of the simple features of musical sounds than they are of higher-level characteristics, which are regarded as more abstract, complex, and remote.

However there are some significant problems with it. First, it relies very heavily on the idea of mental representations, both as the final state that the system achieves, and as intermediate stages along the way. The nature and existence of these representations is purely conjectural (they are inferred in

order to account for behavior), and more fundamentally they suffer from the “homunculus” problem: a representation only has value or purpose if there is someone or something to perceive or use it, which leads to an infinite regress of homunculi inside the perceiver's mind, each of which “reads” and in turn generates an internal representation. Rather than making use of the structure that is already out there in the environment, the outside world is needlessly and endlessly internalized and duplicated (literally “re-presented”). Second, the standard information-processing account tends to be disembodied and abstract, as if perception was a kind of reasoning or problem-solving process, reflecting the strong influence of cybernetics, information theory, and artificial intelligence on cognitive psychology. Perception is treated as a kind of disinterested contemplation, with no connection to action—which bears little relationship to the essentially exploratory and orienting function of perception in the life of an organism. And finally, perception is characterized as working primarily from the bottom up (despite the incorporation of “top-down” processes), with more complex levels constructed from the outputs of lower-level, more primitive processes. Direct experience suggests that this is wrong: if you hear a burst of music from someone's radio, for instance, it is more likely that you will be able to say what style of music it is (opera, hip-hop, Country and Western) than to identify specific pitch intervals, or its key, meter, (p.16) and instrumentation. In other words, people seem to be aware of supposedly “high-level” features much more directly and immediately than the lower-level features that a standard information-processing account suggests they need to process first.

More extensive considerations of the relationship between ecological psychology and the dominant cognitivism of contemporary psychology have been presented by Neisser (1976), who attempts an accommodation between the two, and in the collection edited by Still and Costall (1991), which depicts the relationship in more oppositional terms. My purpose here has been to do no more than present the basic orientation of the dominant paradigm in music perception research, and to point out some of its shortcomings. The next

chapter argues for an alternative to this general outlook, based on the ecological perceptual theory of James Gibson and those who have taken up and developed his ideas.

Notes:

(1.) The writings of John Cage (1973), Murray Schafer (1977), Barry Truax (1984), and David Toop (1995) are some of the better-known exceptions.

(2.) Activity in the peripheral auditory system is necessary, but clearly not sufficient, for auditory perception.

(3.) For a critical review of Handel's book from an ecological perspective, see Heine and Guski (1991).

(4.) Some examples are Balzano (1986), Jones and Hahn (1986), Clarke (1987), Casey (1998), Nonken (1999), Dibben (2001), and Reybrouck (2001).



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