

Book reviews

- **Aniruddh Patel: *Music, Language, and the Brain*. Oxford University Press, 2008. 528 pp. ISBN-13: 978-0-19-512375-3. Price: £35.99 (hardback).**

The study of the interface between music and language has a long and illustrious history, including the vociferous debate between Rousseau and Rameau in the 18th century on the origins of harmony, the disagreement between Spencer and Darwin in the 19th century on the primacy of speech vs. song in the evolution of human communication, all the way to 20th and 21st century co-evolutionary models of music and language, which themselves hark back to Rousseau and earlier thinkers. The most recent addition to this time-honoured discussion is Aniruddh Patel's tour-de-force *Music, Language, and the Brain*, which is a grand synthesis of research from music psychology and phonology, including much of Patel's own research in the area. The book makes a well-argued and persuasive case for a common neurocognitive basis for many aspects of music and language, and should be required reading for anyone interested in music cognition and phonology.

After a 3-page introduction in Chapter 1, Chapter 2 introduces us to the basics, describing the fundamental sound elements that make up musical and phonological systems, with a focus on musical intervals, speech phonemes, and lexical tones. I found this to be a very strong opening to the book and an effective starting point in Patel's search for commonality between music and speech. A central point of difference between music and speech is established from the start: "pitch is the primary basis for sound categories in music (such as intervals and chords), [while] timbre is the primary basis for categories of speech (e.g., vowels and consonants)" (p. 9). Patel uses the term "timbre" when talking about that feature that makes one phoneme different from another, e.g., /a/ and /e/ differ in timbre by virtue of the fact that their spectra differ. This is an interesting musicalization of phonetic differences. It is definitely not the way that phoneticists typically talk about differences in acoustic spectra among phonemes. One potential drawback of this terminology is that we lose the ability to discuss the timbre of the speaking voice in conventional instrumental terms, i.e., what makes one person's voice sound different from another's when they utter the same material. Hence, if two people sang the vowel /a/ on C3, we could distinguish their voices on the basis of timbral aspects related to, for example, nasality or rasp. Be that as it may, Patel's usage makes sense.

The discussion of lexical tone and of attempts to analyze it musically is particularly interesting. As Patel points out, even in tone languages, where pitch plays a significant informational role, we don't see evidence of fixed, music-like intervals either within or across speakers, even in languages where level tones — rather than contours alone — are the phonological targets of interest. We should keep in mind, and Patel makes this point, that the fixedness of musical intervals is something of an abstraction, and that many people show great imprecision when singing musical intervals, both when singing familiar songs and when asked to imitate novel melodies. So, at this early stage in the research, we should not make the mistake of holding speech to a higher standard than music when considering the precision of music-like intervals in either domain. We have yet to see studies that look within individuals and examine their vocal tuning with regard to both spoken and sung intervals.

While Patel is right in pointing out that musical categories are based on pitch and that phonetic categories are based on "timbre", both aspects constantly come into play in both systems, and this is an important place where unification is glossed over by Patel. Most of the speech signal is voiced, and thus speech has a very definite melodic component to it, even at the most elemental level of the phoneme. This is true for even unvoiced sounds, where the /s/ sound has a higher perceived pitch than the /sh/ sound since tongue position alters the perceived pitch of the consonant, with more forward tongue positions being associated with higher pitch. On the other side of things, singing requires the use of some articulatory configuration or another for it to occur; to use Patel's terminology, singing requires the use of some timbral element, be it a single vowel or an epic poem. So, we have to be thinking about a constant marriage of interval and timbre for both speech and music. The discussion of the distinction between tonal and non-tonal languages makes it clear that languages do differ in their use of pitch. Likewise, certain musical systems — such as those that involve overtone singing — make definite use of "timbral" differences in order to play with harmonics. So while music and speech do differ in their relative emphasis on pitch vs. "timbre", the fact remains that both music and speech have to modulate both pitch and timbre all the time. This is an important aspect of the acoustic unification that Patel is seeking.

Patel's synthesis rests on the contention that what unites speech and music at this elemental level is the involvement of discrete categories in both domains: categories of intervals in music and categories of "timbres" in speech. While this is an idea that many people in the field would agree with, Patel goes about making this argument in a rather confusing manner. In the opening of the chapter, he discounts the importance of discreteness (particulateness, combinatoriality) in speech and music due to the fact that such discreteness of sound categories is not human-specific and is found in the vocalizations of birds and whales, among other animals. And yet much of the last part of the chapter focuses on the central importance of discrete sounds categories for both music and speech. This creates the unusual feeling that a process that was initially discounted later becomes lauded as the central point of synthesis for the chapter.

Chapter 3 is about rhythm, again with a search for principles that unite music and speech. The discussion of musical rhythm as a series of hierarchically-organized durational periodicities is clear and uncontroversial, and so I will focus here on the discussion of rhythm in speech. Beyond the mundane notion of speech rhythm as a temporal patterning of phonemic onsets and offsets is the belief that there are some recurrent durational patterns in the speech signal. And this has been driven by the common observation than languages sound different from one another in their apparent rhythm. This led early phonologists to posit isochrony as an organizing principle for speech rhythm, with the familiar classification of languages into “stress-timed” (equal durations between stress onsets) and “syllable-timed” (equal durations between syllable onsets) varieties. Syllable-timed languages, like Spanish, tend to have syllable structures made up of simple consonant-vowel pairs, like the word “película”. Stress-timed languages like English, in contrast, show a much greater variability in syllable structure, due to the phonotactic acceptability of consonant clusters, thus permitting an array of potential monosyllables such as: I, tie, tike, trike, strike, strikes, strikesed. Thus, English syllables can span from one phoneme to as many as seven. In addition, languages like English have syllabic stress in polysyllabic words, accompanied by vowel reduction for unstressed syllables. All of this makes so-called stress-timed languages more diverse phonologically than the relatively homogeneous class of syllable-timed languages, with their more regular transitioning between single consonants and single vowels.

As Patel rightly points out, the idea of isochrony in speech is plain wrong and should be abandoned. The problem is that nobody has proposed a reasonable alternative to it. But instead of proposing an alternative to isochrony in his search for rhythmic principles in speech, Patel falls into the familiar trap of placing the emphasis on *taxonomy* rather than on mechanism as the goal of his analysis. In other words, he makes his objective the discovery of acoustic factors that can account for the perceived differences in language classes, rather than in trying to explain the rhythmic principles that generate these differences to begin with. This is dissatisfying for two reasons. First, while language taxonomy is certainly an important enterprise, it is not our major goal when seeking a unification between music and language; the discovery of rhythmic principles is the goal. Once such principles are found, taxonomic issues should most likely fall into place (while the reverse is not necessarily the case). Second, Patel’s own account of the taxonomic differences, which looks at sequential, syllable-to-syllable variability in syllable durations, gives the erroneous impression that speech rhythm is due completely to low-level phonetic factors. However, a large literature on speech errors and prosodic planning shows that speech is not produced in a purely sequential, left-to-right fashion but that it is planned in larger units that correspond more or less with phonological phrases. In summary, while Patel’s own work on speech typology is interesting and informative, what is really needed for the field of speech rhythm is a setting aside of taxonomic issues and a search for new principles to explain how speech rhythm operates.

Chapter 4 bounces back with a very strong and persuasive discussion about melody in music and speech. I consider this to be the best chapter in the book, and could easily imagine assigning this as a stand-alone article for a university course. The chapter deals with melody and, indirectly, scales in music and speech. Despite the fact that traditional phonology focuses on the contours within speech (*i.e.*, the transitions), the newer theoretical approaches of the last two decades, spearheaded by autosegmental phonology, have instead focused on the level tones of speech, thus inviting comparison to music. As Chapter 2 about the sound elements of music and speech made clear, pitch intervals are cognitively salient in music in a way that they are not in speech. So, in an important sense, it wouldn't really matter if speech were composed of musical intervals, as listeners simply do not perceive it this way. One major reason for this is that speech is incredibly rapid compared to music. If music had pitch transitions as fast as conversational speech, intervals would probably fail to be salient in music either. So, music seems to be all about making sense of intervals, and bringing these transitions into a time domain where they are meaningful to listeners.

Despite this perceptual limitation, it is still perfectly legitimate to examine speech at the level of *production* and see if it involves the use of perfect intervals and recurrent pitch levels, analogous to scaled pitches in music. One confounding factor is that speech shows a steady drop in baseline as it progresses from the beginning of a sentence till the end, a phenomenon phonologists refer to as declination. This is accompanied by a concomitant compression in pitch range such that a stressed syllable at the end of a sentence will involve a smaller rise in pitch than one occurring at the beginning.

But this raises a deeper issue, one that is almost never mentioned in music psychology. Music psychology sees musical works as pre-composed, fixed-pitch objects, ones that are implemented on fixed-pitch instruments. What researchers fail to study are vocal improvisations, such as the types that occur in chants throughout the world. This is much closer to the domain of speech, since the musical material is not pre-specified through notation and since the human voice doesn't come with a fixed tuning. I have heard chants from many cultures in which the vocal tuning sounds quite imperfect from the standpoint of equal temperament. There is a strong need to develop a research program to examine this type of singing before we can understand the nature of intervals in speech. As I mentioned earlier, we shouldn't hold speech to a higher standard than music. We need much more cross-cultural research on vocal tuning, and for the moment there is virtually no experimental research on this topic.

Patel's presentation relies on the use of the Prosogram algorithm for extracting level pitches from the vocalic segments of speech. The end result of this extraction is a kind of piano-roll representation of level tones from the steady-state segments of these vowels. (It should be pointed out that Prosogram's extraction procedure does not rely on frequency alone but is moderated by amplitude as well, but that is not

important here.) The basic point is that spoken sentences can be reduced to a series of level tones, which comprise much of the foundation of speech's melodic domain. But what about tuning? There are two issues to address here. First, what kinds of intervals are seen between the level tones of sequential vowels? And second, are there recurrent pitch levels that define a scale? Looking to the first issue, Patel's analysis of a single English sentence shows that few of the inter-vowel intervals are comprised of simple-integer ratios. Hence, they look un-musical. There is definitely the need for a larger sample than one sentence from one speaker. We also have to keep in mind my caveat above about the potential "unmusicalness" of intervals produced vocally in native chanting. Next, what about scaling? This is indeed a complicated question, not least because of the declination that occurs in normal declarative sentences. Patel cites the work of others in saying that "British English may use three phonologically distinct pitch levels in its intonation system, whereas French may only use two" (p. 225). This just cannot be correct if we are talking about absolute pitch levels. I don't have the data to refute this, but I'm sure that two level tones could not possibly explain French phonology nor three English phonology. So, there is obviously need for much more detailed research in this area. Patel doesn't really tie these strands together, and so the chapter, despite its spectacular breadth and insight, falls short of the promise of finding a unification between musical melody and speech melody. What's clear to me is that such a unification must be looked for at the level of generative mechanisms, not perceptual mechanisms.

The previous two chapters represent the strongest case for a unification between music and language, with a focus on the acoustic properties of melody and rhythm. The next two chapters move on to examine syntax and semantics, and bring us onto much shakier ground. For music, the case for syntax is conceptually easier to make than that for semantics, since the combinatorial nature of music has been recognized for more than a millennium, and the cognitive notion of hierarchical organization has been applied to music with great success for several decades now. Therefore, many people accept the idea that music has a syntax, so long as term syntax is applied in the broad sense of structured organization rather than in the narrow sense of propositional syntax.

After presenting a nice review of topics that could reasonably be said to fall under the heading of musical syntax (*e.g.*, key, scale, chord structure, cadence), Patel makes the argument that others have made before him about the basic hierarchical and combinatorial organization of musical structure. Thanks in large part to the work of Lerdahl and Jackendoff, many people both inside and outside of musicology are in agreement about this basic similarity between music and language with regard to hierarchical organization. The real question is whether this is merely an analogy or whether there is an underlying mechanistic basis for this. If it's the latter, then linguists should really stand up and take notice.

Patel doesn't deny that the syntaxes of music and language deal with different "representation networks"; the objects that they organize and the phrases that they

generate (*e.g.*, chords vs. words) are quite different in kind. However, he argues that there may be a sharing of neural resources for the operations of these syntactic mechanisms. Neurally, the argument goes that “linguistic and musical syntactic representations are stored in distinct brain networks, whereas there is overlap in the networks which provide neural resources for the activation of stored syntactic representations” (p. 283f). I think that this is as good a theory as we have at the moment. However, it is still very much a black box, and so linguists are not going to be knocking at our door until mechanistic details are worked out. In Patel’s model, the “representation networks” (*i.e.*, where categorical knowledge about chords or words is located) are distinct, whereas the “resource networks” (*i.e.*, where chords or words get combined to create hierarchical linguistic or musical phrases) are shared. We just don’t have an idea of how a common resource network could operate on very disparate inputs such as chords and words to create both sentences and melodies. This is definitely one of the interesting problems of this field but we are a long way from having the answer. As an aside, a sharing hypothesis has very important evolutionary implications because it suggests that the syntaxes of music and language may have emanated from a common ancestral “resource network”, something that should be of interest to language evolution theorists but which Patel doesn’t discuss in his evolution chapter.

Chapter 6 brings us towards theories of musical meaning and semantics. As with other chapters in the book, this chapter begins with a very strong overview of the issues, where Patel again demonstrates his clear mastery of the relevant literatures. As mentioned above, theories of musical syntax have come to gain acceptance in cognitive psychology because of their reliance on hierarchical organization, and so the true litmus test of a unification of music and language is semantics. Patel already gives us some indication in Chapter 5 of where his ideas will be going when he acknowledges that the “representation networks” of music and language are different and neurally distinct. So, is there really a strong case for talking about a unification between music and language with reference to semantics? After all, it is these “representation networks” that embody semantic information.

To begin with, many people make a distinction between intrinsic and extrinsic meanings of music. Extrinsic meanings come about through music’s association with various aspects of social functioning, including performance contexts, verbal texts, and other associated narratives. This is not terribly problematic for theories of semantics (either linguistic or musical) because music simply piggybacks on linguistic meaning quite directly. What is more difficult to explain is intrinsic meaning, the meaning that relies on musical sound all on its own, divorced from social reference or linguistic meaning.

Theories of intrinsic musical meaning invariably make reference to the *emotional* meanings of musical sounds, while theories of lexical meaning in linguistics don’t, *nor do they care about sound at all*. They make reference to the properties of objects in the most abstract sense (*e.g.*, that collection of properties or exemplars that define

the prototypical category of “cat”). One could argue that one important type of property of an object is the emotional appraisal that a speaker attaches to that object. After all, “My mother is a great cook” could easily mean its opposite based on intonation. But, oddly enough, semantic theory doesn’t really deal with this. The sub-disciplinary boundaries within linguistics are such that consideration of the emotional meanings of the speakers thrusts the issue out of the realm of semantics and into that of pragmatics or phonology. While this certainly represents a big limitation for linguistic theories of meaning, is music really the saving grace here? Is a music/language unification theory going to clarify the nature of intonational meanings of language and help us unravel what a sentence really means? Personally, I think not.

In thinking about emotional expression, there seems to be a realm where music and language show a definite sharing of resources for creating meanings, and then another where they are quite distinct. The only one that Patel talks about in his unification is the first category, namely arousal factors related to register, tempo, loudness and timbre. Modulations of these parameters seem to have strongly parallel emotional interpretations in music and speech. Unfortunately, Patel makes the mistake of invoking Spencer’s 1857 “speech theory” to argue that music acquires these features of expression from speech. This idea was well refuted by 19th century critics of Spencer’s theory. It is very likely that these parallels in emotional interpretation are derived from a common underlying system of emotional expression that guides not only music and speech but gestural expression in humans and other animals.

But this kind of expression of emotional arousal is not the only way that speech conveys prosodic meanings. The domain-specific way is through intonational melodies. Patel mentions them in his chapter on melody but doesn’t mention them in his chapter on meaning. For me, it’s a notable omission. But even if he had mentioned them here, I don’t think that music would provide any explanation for them. I think it’s fair to say that phonologists have almost no insight into how they work. We all know as everyday conversationalists that we are able to discern a dazzling variety of emotional nuances in the tones of voice of speakers. People like to talk about this as being the “music of speech”, but I sincerely doubt that a musical analysis of speech will reveal the principles of these intonational melodies. If there is one factor that might be common between the domains it is probably contour, for example that rising phrasal contours convey uncertainty or conflict and that falling contours convey certainty or resolution. But, as Patel points out in Chapter 2, music’s use of pitch contours occurs with regard to scaled intervals while speech’s use of contour doesn’t (at least not in a way that is perceptually relevant to listeners). So, it seems that while a unification of music and speech can accommodate generic emotional factors related to register, tempo, loudness — and perhaps even contour — what is going to remain a line of distinction between music and speech are, on one hand, musical scales and all the emotional connotations associated with them,

and on the other, the myriad intonational melodies that characterize human speech and the emotional meanings associated with them. And, to bring the discussion full circle, there is no analogue of a word in music, and so lexical semantics is always going to remain a huge divide. The most music can do is use its unique sound devices to work with language (and sometimes against it) to enhance the emotional meanings of the communicator. Where language, narrative and social context happen to be absent and there is nothing to denote, then music provides us with an example of pure emotional representation, such as is the case with much instrumental music.

The last chapter of the book deals with evolution. Patel's major conclusion is that musical capacity is not an individual-level adaptation. I couldn't agree more, although for completely different reasons. For Patel, it is because music is simply not an adaptation, and for me it is because music is a group-level, not individual-level, adaptation. Patel's job is easier than mine. He merely needs to 1) show that individuals can and do survive quite well without music, and 2) pick apart each cognitive capacity that we associate music and show that it is either not domain-specific or not human-specific. This he does with great skill. My job, instead, is to argue that, during the course of human evolution, groups comprised of musical individuals tended to outsurvive groups of non-musical individuals, in other words that music-making conferred a competitive advantage onto groups rather than onto individuals within those groups. For me, music does this by helping individuals overcome self-interest and achieve cooperation, one of the hallmarks of human nature and human society. So for me, music's most telling and human-specific design features are those that relate to coordination and synchronization, both in time and in pitch-space.

At the end of the chapter, after all the picking apart of musical capacity has been done, Patel muses "Might beat-based rhythm processing reflect evolutionary modifications to the brain for the purpose of music making?" (p. 402). Entrainment of movement to a beat permits us not only to sing together and play instruments together but to dance together. It is one of the best arguments that music evolved to coordinate individuals and perhaps even promote cooperation as a result. It won't matter at all if it is convincingly shown that parrots and cockatoos are able to move their bodies in synchrony to a musical beat, as is being much discussed these days. The fact will remain that cockatoos and parrots don't sing coordinated choruses, don't create coordinated dance movements, and, most importantly, don't defend group territories. Humans do all of them. And as with howling wolves, duetting gibbons and duetting songbirds, coordinated vocalizations are a big part of how all of these species, ourselves included, defend year-round territories.

While Patel denies that pitch processing could have any kind of music-specificity or innateness (essentially making the Spencerian argument that music is derived from speech), he fails to mention another hallmark feature of music processing, namely the blending of musical parts that underlies choral textures like monophony,

homophony and polyphony. The capacity to achieve these choral textures requires not only synchronization in time (“beat-based rhythm processing”) but also vocal imitation and the ability to intentionally match (or mismatch in the case of homophony and polyphony) musical parts. I think that music psychologists have missed the boat on this point, and that the cognitive capacity to create choral textures is domain-specific and human-specific. This is yet another significant indicator of the importance of music for human coordination. In thinking about this ontogenetically, the relevant research topic deals with vocal imitation of pitch. But there has been scant research on the subject. Most work in children looks at the singing of familiar songs and hence relative-pitch processing. Little, if any, has looked at the capacity to vocally match absolute pitch. I suspect, based on anecdotal evidence, that this capacity develops at roughly the same ontogenetic stage as beat-based rhythm processing, around the ages of 4 to 5. Thus, a lot of what seems to be shared between music and speech with regard to pitch and rhythm processing seems to develop early, while those things that seem to have the most specificity for music, like vocal imitation of pitch and metric entrainment, develop later.

To conclude, Patel’s book has all the makings of a classic. It will be the standard book on the topic for many years to come. Patel has done a great service for music psychology by synthesizing so much information in such an eloquent, insightful, and scholarly manner. I heartily recommend this book to colleagues in musicology, linguistics, and beyond.

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- Eric Clarke. *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning*. Oxford University Press, 2005. ISBN 0-19-515194-1. ISBN-13 978-0-19-515194-7. 256 pp. (hardcover) \$45.00.

Ways of Listening is the first book-length treatment of music and ecology. In it Eric Clarke develops principles derived from James Gibson's ecological theory of visual perception from the 1950s-70s. Its focus is on passive listening — “armchair hermeneutics” (123) — and the extent to which intense experiences can inform the listener's sense of her subjectivity. It is not about performing or how performers listen, and makes relatively few claims that might be transferred to that quite different world of actions and consequences. Moving in a broad arc from scientific to cultural perspectives on musical meaning (10), Clarke proposes that psychology and musicology can be “combined in a fruitful and stimulating manner” (9), and he writes with equal aplomb in the discourses of empirical and critical musicologies. The main theory is perhaps no longer as radical as it once might have been, but Clarke packs the book full of remarkable ideas and extrapolations of Gibson's ecological theory, which invite a rethinking of many of the key assumptions in the scientific and cognitive study of music. This book is sure to become a staple constituent of reading lists.

In the Introduction Clarke argues strongly for a meaning-centred approach to the phenomenon of music. He writes that “when you hear what sounds are the sounds of, you then have some understanding of what those sounds mean” (3), returning to this in the Conclusion with the remarks that “To listen to music is to engage with music's meaning” (189), and that “an ecological approach to listening provides a basis on which to understand the perceptual character of musical meaning” (189). Indeed, the converse is just as important to his narrative: “to hear a sound and *not* recognise what it is, is to fail to understand its meanings and thus to act appropriately” (7). (This depends on what is meant by “appropriately” (*cf.* 18) and for whom the psychologists define it.) For Clarke, “the primary function of auditory perception is to discover what sounds are the sound *of*, and what to do about them” (3). This is the call of the wild, and evolution and its metaphors drive the musical process: “when you hear what sounds are the sounds of [*i.e.* what they specify in the world], you then have some understanding of what those sounds mean” (3). The question of musical meaning lies at the core of this book, though the question begged of whether understanding musical meaning is coextensive with understanding music is not considered (*cf.* 189). More specifically, the meaning at issue in this book can, says Clarke, “be distinguished from musical meaning that arises out of thinking about music, or reflecting on music, when not directly auditorily engaged with music” (5). (It is a pity that there is no directed listening with the book: “listen to the accompanying CD, track X, at Y mins Z secs”.)

Clarke characterises the cognitive “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” (12). This approach regards “perception as simply the starting-point for a series of cognitive processes — the information-gathering that precedes the real business of sorting out and structuring the data into a representation of some kind. Perception starts when stimuli cause sensations, according to this view, and all the rest is cognitive processing of one sort or another” (41). Clarke notes four main problems of this approach: structure “is imposed on an unordered or highly complex world by perceivers” (12); “it relies very heavily on the idea of mental representations” (15); it “tends to be disembodied and abstract, as if perception was a kind of reasoning or problem-solving process” (15); and it “is characterised as working primarily from the bottom up (despite the incorporation of ‘top-down’ processes)” (15).

In contrast, Clarke offers a “perceptual approach” (4) and proposes to ground this in perceptual principles more general than those specific to music, namely ecological theory. He offers four reasons for this approach. First, “sounds are often the sounds of all kinds of things at the same time” (4); secondly, “Musical sounds inhabit the same world as other sounds” (4); thirdly, “It is self evident that we listen to the sounds of music with the same perceptual systems that we use for all sound” (4); and fourthly, the ecological approach “takes as its central principle the relationship between a perceiver and its environment” (5, *cf.* 43, 123).

Chapter 1 contains the essential theory, organised as follows: perception and action (19), adaptation (20), perceptual learning (22), ecology and connectionism (25), invariants in perception (32), affordance (36), nature and culture (39), perception and cognition (41). Arguing against the assumption that cultural, ideological, and social elements of musical experience are more distant or abstract than its basic perceptual attributes, Clarke proposes that an integrated theory of perception can account for the directness of the listener’s perceptual activities in various environments, and responses to such factors as spatial location and physical source, as well as the more familiar elements of structural function and cultural value. Clarke is obliged to extend Gibson’s ecological theory outwards into (man-made) culture, and to make the assumption that the material objects and practices that constitute culture are no less directly specified in the invariants of music than the natural environment is specified in its auditory information. This assumption also requires Clarke to state that “The conventions of culture, arbitrary though they may be in principle, are in practice as binding as a natural law” (47).

Clarke argues that the listener perceives the world directly, and that this reciprocity (elsewhere Clarke calls it an “affinity” (19), which has more or less similar connotations) is not inexplicable, but is simply the consequence of adaptation, perceptual learning, and the necessary, unavoidable interdependence between perception and action (an idea long familiar from Wittgenstein). This means, for Clarke, that the investigation

of music should focus on the invariants that specify the phenomena that music can afford in the face of the diverse abilities of different listeners. Moreover, and perhaps more importantly regarding the wider disciplinary (methodological) implications of Clarke's adaptation of ecological theory, the resulting theory brings together musical elements that are often taken to be quite distant from each other: *e.g.* physical sources, musical structures, cultural meanings, critical content (the last in a broadly Adornian sense that Clarke picks up on briefly right at the very end (206)). Underlying all this is the commonality of the perceptual principles upon which musical sensitivity depends and the "reciprocity between listeners" capacities and environmental opportunities (affordances) (47).

Chapter 2 illustrates how the theory expounded in Chapter 1 applies to a real example. (Here the lack of an accompanying DVD is felt the most.) Clarke selects Jimi Hendrix's performance of "The Star Spangled Banner" at Woodstock in 1969, and unpacks the ways in which the different components of this (recorded) performance's meaning, which relate to its sound, structure, and ideology, are both juxtaposed in a sonic palimpsest, and simultaneously there for the listener to perceive and appropriate in an interpretation of the performance's meaning. Clarke regards the recorded performance "as a wordless piece of musical critique" (48, *cf.* 51, 206), and, as such, reconstructs the potential meanings of the performance from the recorded trace of the performance; this is a retrospective, leisurely analysis of an iconic moment in American cultural history, pursuing the idea that "the impact of the performance can be traced to properties that are specified in the sounds themselves" (51).

Of particular importance for the underlying theory Clarke develops is the idea that "Culture and ideology are just as material [...] as are the instrument and human body that generate this performance, and, as perceptual sources, they are just as much a part of the total environment" (61). Not mentioned (perhaps for obvious logistical methodological reasons) are the contributions to the total performance event of the thousands facing and cajoling Hendrix into the very performative excess that made this event both unique at its moment in time and aesthetically and historically replete with affordances available to others separated in time or place. In this respect, even though some things that are specified are not more abstract than others but simply "specified over a greater duration of perceptual information" (59, *cf.* 35-6, 191), one might still ask about the three levels in Figure 2.1, whether they are related in terms of some type of supervenience, moving from or passing between "cultural practices" to "musical material" to "sound" (60): within the simultaneity of their co-presence, what are their inter-relationships?

Chapter 3, "Music, Motion, and Subjectivity", argues that motion and gesture in music are perceptual phenomena, and that the specification of motion in music is roughly similar to how it is specified in "everyday" situations. There are at least two types of motion in musical events: the real movements of the actual performers, and what Clarke calls, in contradistinction to "real" or "metaphorical" movements, the

“fictional” movements within the music (he treats fictional and “virtual” as the same thing, which goes against the Deleuzian approach but doesn’t affect his own argument). These latter movements contribute to the virtual constitution of music, and draw the listener into engaging with the music dynamically. Indeed, “Music provides a virtual environment in which to explore, and experiment with, a sense of identity” (148-9). Clarke proposes that there are therefore interesting questions of agency thrown up by musical motion and movement, and he summarises these with four questions: “Who or what is moving, with what style of movement, to what purpose (if any), and in what kind of virtual space?” (89).

Underlying this chapter is, as Clarke acknowledges, the idea that the listener is engaged, alienated, distracted, bored, or left indifferent by the various subjective states afforded by the music (or indeed a dynamically changing combination of the above) (89-91, *cf.* 138), and that subjective musical engagement turns on motional, proprioceptive, and corporeal components of music. The main contribution of this chapter is the idea that “a perceptual [as opposed to cognitive] approach allows for the experience of either self-motion or the motion of other objects” (75). This idea has fruitful and extensive implications for the study of music as an ethical and social phenomenon, for the ways in which listeners can be said to be learning, rehearsing, acting, and developing as citizens (however this is defined) through and with music. To give just one example, Clarke’s useful stylistic taxonomy of polyphonic textures (76), in which the listener is “at times an ‘overhearer’ of musical events and at others a participant among them” (82, *cf.* 86), has much in common with a potentially Bakhtinian approach to texture (via the concept of polyphony), and yet it is worth noting that Bakhtin’s approach has itself been frequently criticised for its naive assumption that all such interactive relationships between authors and heroes (read: listeners and musical events) are noble and open, and untarnished by the threats of power, ideology, and voyeurism. The great worth of Clarke’s extrapolated ecological approach is precisely that it seems to offer tools for dealing with these issues, since it articulates the importance of attending to the “sensitivities, and interests” of the listener (91, *cf.* 7, 18, 32, 37) as well as the “opportunities of the environment” (139), and of acknowledging “the impossibility of ever knowing what the subjective experience of another organism might be like” (156).

Following Chapter 3, which considers musical “engagement” in the sense of what happens during the listening experience here and now, Chapter 4 turns to the concept of subject-position, the “attitude” (91, 93) created in conjunction with the music, and presumably also brought to bear from prior experience. This concerns the manner in which the listener engages with the music’s subject-matter, the tone of engagement providing an ideological angle on the musical meanings interpreted by the listener.

Given the mutualism of perceivers and environments central to ecological theory, Clarke naturally explores the way in which the perceiving subject (the listener) creates and assumes a position in relation to the music that constitutes her object of

perception. He is obliged to extrapolate from the “everyday” situations that Gibson had focussed on in order to make the cultural turn. While, as he notes, “the subject-position of everyday life is overwhelmingly one of transparently active engagement” (124), aesthetic objects are (almost by definition) resistant or recalcitrant objects that direct the listener elsewhere, that distract, that limit the natural (everyday) ability to act in an (apparently) freely-chosen manner. Hence, in aesthetic activity the distances and critical perspectives between objects and perceivers are not just there (the degree to which they are emphasised and used is a matter of style) but emphatically central to the perceptual activity and meaning-interpretations of the listener. Clarke’s conclusion is that the rhetoric of “codification” familiar from semiotic approaches to musical meaning gives way to the perceptual principle of “specification”, the latter allowing the connection between aesthetic and practical perception to be restored. Towards the end of this chapter there are a couple of references to the role of performing in meaning generation, in particular “the potential for performers to mediate subject-position” (122), an idea that deserves treatment in its own right in the future.

Chapter 5 underlines the contrast between approaches in which autonomy is posited as an ideal, and the ecological approach emphasising the adaptation of the organism to its environment (this phrase presumably translates as the adaptation of the listener to the real and virtual musical worlds with which she engages). Clarke offers two approaches to the concept of autonomy, generally managing to do so without straw man bashing (this is not the first time autonomy has taken a bashing!). First, he points out that if it is taken on its own terms and the violence of its founding ideology is accepted, then music is taken as affording a virtual world — sometimes organic (68), sometimes anthropomorphic (87, 89), sometimes both, perhaps sometimes neither — in which listeners circulate and populate the system like virtual citizens. This approach allows the hermeneutic analyst to unpack the motivic, textural, metrical, and tonal gestures that are specified by the music. Secondly, Clarke undertakes a deconstruction of autonomy, using ecological concepts as tools. This is an interesting argument, premised as it is upon the fruitful illusion of autonomy, though I am not sure that a deconstruction is really needed if the full implications of the “virtual” are accepted and assimilated into the extrapolated ecological theory, as Clarke seems to do.

Either way, Clarke is right to pursue the point that, since “structural listening is peculiar in encouraging the listener to turn away from the wider environment in searching for meaning” (134) and to take up a stance “*against* the world” (146), other complementary perceptual activities are at the very least needed in addition, if not also prioritised, in any account of musical listening. Only in this way can the liberating potential of ecological theory be realised and hermeneutic analysis move away from approaches that premise their methodologies upon Modernist notions of “submitting” to the formal discipline of listening (135). Given that the most important element in listening might be the “ideological component” (136), it is

curious that Clarke offers only fleeting glimpses of the actual world of the listener at various points in this chapter (and indeed other chapters). To give just two examples: “Just as concentrated listening [...] can be diverted in unexpected directions, so too a listener can be unexpectedly and suddenly drawn *into* some music that until then had been paid more distracted and heteronomous attention” (136); and, “At one moment I can be aware of the people, clothing, furniture, coughing, shuffling, air conditioning and lighting of a performance venue, among which area the sounds and sights of a performance of Beethoven’s string quartet Op. 132 and all that those sounds specify; and at another moment I am aware of nothing at all beyond a visceral engagement with musical events of absorbing immediacy and compulsion” (188). Perhaps such remarks, premised on a methodological investment in ethnographic observation, might lead towards a thick ecological description of musical listening, towards some kind of phenomenologically adequate position regarding what the listener actually does. After all, Clarke opens the very first page of *Ways of Listening* with the point that “the primary function of auditory perception is to discover what sounds are the sounds *of*, and *what to do about them*” (3, second emphasis added).

Chapter 6, continuing the issues articulated in Chapter 5, focuses on the first movement of Beethoven’s String Quartet in A minor Op. 132. Clarke shows how different “ways of hearing” or different “components of a composite hearing” (both 187) (he seems to equate these two phrases) can be tackled with ecological theory. Some components of the music align quite easily with the ideology of autonomy (structural processes of various sorts), but other aspects of Clarke’s analysis — arguably the most interesting for his approach — are found “outside autonomy” (whatever that means). These include musical topics, virtual motion, agency, and perception of physical movement. Clarke uses these ideas to reinforce the idea that the world into which the listener is drawn is “far more heterogeneous and heteronomous” (187) than any approach aligned with the ideology of autonomy. As he notes, “the supposed autonomy of this music is as perceptually illusory as it is theoretically unsustainable” (188), and we should acknowledge that autonomous listening (or at least the attempt to engage in such a manner) is but one among a variety of modes of listening.

In the Conclusion Clarke notes a few ideologies, assumptions and by-products of the ecological theory he has expounded. For example: “The general principle of ecological scale is an important corrective to the temptation to believe that properties of perceptual objects must be significant simply because they can be shown to be there by a measuring device” (196). He also notes for the future that empirical studies could flesh out his theory (*cf.* 46-7) with regard to several areas: “whether the distinction between self-motion and the motion of others is borne out empirically, and, if so, whether there are specific stimulus features that can be identified as the invariants for self-motion” (198), whether and how the distinction between actual and virtual motion is borne out (199), the nature of “the invariants for various kinds of style categories, or musical structures” (199), the nature of “the conditions that specify more or less engaged or alienated subject positions” (200), and the nature of

the durations of specifications (200). Making a passing nod to recent musicological thought, he notes that “Interpretative writing and speaking *are* forms of action, but of a comparatively discreet kind” (204), and admits that the issue of autonomy has haunted many of the arguments in the book (205). Indeed it is; and Clarke signs off with a intriguing rhetorical flourish on this very note, a brief glimpse into a fascinating debate to be held between ecological theorists and critical theorists. “Because ecology is first and foremost about adapting to, and conforming with, the world, it runs diametrically counter to the idea of art as critique. The critical value of art, from almost any perspective, is a function of its resistance to current conditions, its refusal to conform to easy adaptation. If the ecological idea is the optimally efficient mutual adaptation of organism and environment, then it is against this background assumption that music achieves its uncomfortable and critical power” (206).

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- Denise Grocke and Tony Wigram (2007). *Receptive Methods in Music Therapy. Techniques and Clinical Applications for Music Therapy Clinicians, Educators and Students*. London & Philadelphia: Jessica Kingsley Publishers, 288 pp. ISBN-13: 978 1 84310 413 1 and ISBN-10: 1 84310 413 X. Paperback. Price: £19.99 or \$34.95

When reading the book *Receptive Methods in Music Therapy. Techniques and Clinical Applications for Music Therapy Clinicians, Educators and Students*, I am reminded of the title of a composition by Andrew Schultz: "Music is a gentle hammer".¹ Listening to music sometimes seems to pierce body and soul, while at other times it is as if the music is wrapping us up in a gentle breeze. Music allows for inner experiences at different levels and supports a variety of images. Listening to music is a powerful tool, both in music therapy and in everyday use. Accordingly, a book on techniques and clinical applications of receptive methods in music therapy is extremely valuable.

Receptive Methods in Music Therapy (2007) is the third book in a series aiming at providing practitioners with knowledge and skills within the three main categories of music therapy interventions: improvisation (Wigram, 2004), song composition (Baker & Wigram, 2005) and now a book on *listening*. This book is a *practical* book, which describes, rather than compares, the specific use of receptive methods and techniques in clinical practice and research in music therapy. Illustrative clinical vignettes enlighten the basic practices described in the text. This ten chapter book fills a gap in the music therapy literature and offers an important companion to Frohne-Hageman's more philosophically-oriented edited book on *Receptive Music Therapy* (2007).

Professor Cheryl Dileo sets the tone in her foreword, pointing to the fact that *all* music ultimately is received or heard by the client, no matter how the music is produced. Listening to music has always been important in people's lives throughout history (Horgen, 2000).

The first chapter focuses on engaging with clients verbally and musically. The authors make a valuable point when they address how the music therapist has to be comfortable with silence in music therapy, in order to allow the client to process the verbal and musical dialogue in her own way. Other useful reminders are how the therapist's different value and belief system influence the therapist-client relationship and the importance of respecting the client's personal integrity.

The second chapter highlights the selection process of music for receptive methods in music therapy, offering a useful comparison of the elements of music for relaxation and music for imagery. However, it is important to bear in mind that

(1) Schultz, A. (1994). Music is a Gentle Hammer. In J. Pressing (ed), *Compositions for improvisers: An Australian Perspective*. Victoria: La Trobe University Press.

sometimes there may be subtle differences between the two. Due to the music's ambiguity, the client may allow herself to engage in the music the way *she* does, in spite of the therapist's anticipated function of the music as good for relaxation or evoking imagery. Nevertheless, this table offers a useful tool for reflection before choosing music for different purposes.

The next eight chapters focus on different methods in receptive music therapy. Chapters 3 and 4 address relaxation and receptive methods for children, adolescents and adults. The material on children and adolescents is mainly provided by music therapists who work with group of clients within a hospital setting, while the material on adults derives from different areas of practice. The text provides important ideas and reflections concerning preparation, induction, and choice on music. In addition, contraindications to the different choices of music are discussed. The musical pieces suggested come from classical music, new age and film music.

Chapter 5 describes the potential of music listening, focusing on visualisation and imagery. The authors provide a list of types of imagery experiences, which may occur in guided/unguided settings and within individual and group music therapy. There are also examples of short and longer excerpts of music, which may be used during the music listening. The duration of the piece of music depends on the context in a broad sense and on the therapist's intentions for the listening experience.

In chapter 6, there is a focus on discussion and analysis of song lyrics, reminiscence in elderly care settings and how songs can be used in a musical "life review". Song (music) communication and song (lyric) discussion relate to bringing preferred recorded music into the session either by the therapist or by the client. The authors offer a working method for discussion of song lyrics, including i) bringing recorded music, ii) listening together and iii) verbal discussion of the song *i.e.* its meaning to the client(s) and analyses of the lyrics of the song. The chapter also includes an extensive discography of contemporary artists, supplemented by issues expressed in different songs.

Chapter 7 addresses perceptual listening and music appreciation. The authors provide suggestions and guidelines for using recorded music in music appreciation sessions. In addition, there is a focus on how clients perceive and attend to music listening. The latter is important not least due to the fact that music may affect any emotional state, irrespective of age and verbal capacity.

Chapter 8 introduces receptive music therapy and art media, including music collages, drawings and narratives. There are useful discussions on client suitability, materials and procedures and moving case examples where music interfaces with other creative arts media, illustrated by pictures of collages. Since the photographs in the book are in black and white, I would strongly suggest visiting the publisher's web site, offering the five collages in full colour (<http://www.jkp.com/catalogue/book.php/resources/9781843104131>).

Vibroacoustic therapy in receptive music therapy is presented in chapter 9, which is an extensive and informative presentation including many references to research.

The clinical applications include construction of vibroacoustic equipment, construction notes and examples of software. Thereafter follows methods of intervention and clinical procedures, which also include clinical applications and contraindications. A vibroacoustic approach influences both psychological and physiological processes, which again shows the significance of carefully selected music. The chapter offers a list of classical music selections for vibroacoustic therapy.

The last chapter concentrates on music and movement, focusing both live and recorded music selected primarily for clients with physical disabilities. This is a highly important chapter since everybody has — and is — a body, and expresses oneself through the body. Useful advices are given for working together with parents, physiotherapists or carers in the client's environment. The chapter ends musically with a transcription of a good-bye song composed by one of the authors. *Receptive Methods in Music Therapy* closes with a comprehensive reference list and useful subject and author indexes.

The book does not aim to give a comprehensive viewpoint of all receptive methods. However, I would have liked to see "self-listening" included. Self-listening, a variation of receptive music therapy where the client listens to a recording of his/her own improvisation, performance, or composition, to reflect upon oneself and the experience (Bruscia, 1998, p. 125), is used by many music therapists. Bearing in mind the authors' broad expertise, it would have been exciting to hear their voices also in relation to such a self-listening procedure.

The language in the book is easy to read and the authors consider ethical issues with respect for both the clients and the music. Such respectful and ethical considerations, are also evident as the authors advise that the therapeutic methods and techniques offered in the book should be performed by professional music therapists or trainee music therapists under supervision. Nevertheless, I think the book is extremely important to everybody interested in music listening. I assume many readers will also be inspired to develop *adapted* versions of music listening outside a music therapy setting.

The book provides a significant contribution to the field of receptive music therapy with its structured content and the variety of ideas of "how-to-do-it" in real life music listening, including numerous tables, figures and examples of client and music therapist dialogues. The book is clearly presented by distinguished and experienced authors within in the field of music therapy and serves as an informative toolbox of useful protocols and step-by step instructions, provided with enlightening clinical vignettes. *Receptive Methods in Music Therapy* has an obvious place within the core curriculum of the training of a music therapist and should be a natural part of every music library. I highly recommend this book.

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