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Musical Works and Orchestral Colour

Abstract

In music ontology, 'pure' formalists regard musical works as 'colourless' sound structures. One alternative, known as timbral sonicism, accepts that a musical work's orchestral colour is a factor in its identity, but denies that the use of the specified instruments is required for an authentic rendition of the work provided that sounds *as of* those instruments are achieved. This position has been defended by Julian Dodd. In arguing against his view, I appeal to empirical work showing that composers, musicians, and listeners typically hear through music to the actions that go into its production. In this respect, musical listening reflects the standard account of 'ecological hearing'; we appreciate sounds as providing information about their sources rather than for their intrinsic qualities. On this basis, I suggest that musical instruments are not merely means to the production of the sounds of performances. Their use is mandated if such performances are to be properly formed. More specifically, when composers are able to make the instrumentation of their compositions central to the identity of those compositions, accurate performances must involve the appropriate use of the specified instruments.

Musical Works and Orchestral Colour

Imagine a formalist who argues that colours are incidental to the identities of the paintings that display them. What is essential to their identities, he suggests, is their depictive content and formal structure, not their colours.

Against such a view, one might argue that the colours of paintings often make a vital contribution to organising the represented space or revealing its contents in other ways. In works such as Claude Monet's paintings of haystacks and water lilies and Georges Seurat's *La Grande Jatte*, outlines and edges crucial to the perception of what is depicted would be obliterated were the works decolourised. More generally, colour can contribute to the painting's perspectivalism, with more distant objects appearing bluer for example. Other structurally relevant spatial effects are generated via interactions between the relative area, contrast, complementarity, saturation, hue, and brightness of the colours used. By mapping the characteristic hues of what it depicts, a painting's colours can contribute to its representational verisimilitude. And where a painting's colours are at odds with what it depicts, as in works by Vincent Van Gogh or André Derain, distinctive expressive effects can be achieved.[1] Colour can also contribute symbolic and other associations relevant to recognising and appreciating the work's content. For example, consider Garry Neill Kennedy's *Figure Paintings* (1984), a wall painting of five grey-coloured regions labelled, 'Fig. 1', 'Fig. 2', etc. The greys in Figures 2, 4, and 5 are indistinguishable. Kennedy's notes for the work, which are posted nearby, read:

> *Fig. 1* paint used to cover ships of the Canadian Navy.
> *Fig. 2* paint used to cover ships of the U.S.A. Navy.
> *Fig. 3* paint used to cover ships of the Mexican Navy.

Fig. 4 mixture of *Figures 1* and *2* in quantities proportional to the amounts required to paint the fleets of Canada and U.S.A.

Fig. 5 mixture of *Figures 2* and *3* in quantities proportional to the amounts required to paint the fleets of Mexico and U.S.A.[2]

Despite the implausibility of a formalism that discounts the colour of paintings, a corresponding theory for music is widely supported. In music, the equivalent to colour is timbre—that is, the sonic characteristics that distinguish various instruments or voices even as they play or sing the same notes. Timbre is commonly referred to as orchestral or vocal *colour*. The formalists just mentioned characterise musical works as *pure* (that is, colourless) patterns of notes or sound sequences. In other words, they regard both the piece's instrumentation and the timbral qualities generated by the use of the indicated instruments as irrelevant to its identity.

For example, William Webster maintains that Bach's Violin Concerto in E Major would be legitimately instanced if played on any instrument, so long as the note relationships were preserved.[3] Peter Kivy claims: 'Performing a Bach fugue with a choir of kazoos … cannot, of itself, make the performance a performance of something else'.[4] Roger Scruton observes: 'There is nothing in the concept of a pitch pattern that determines the timbre that will most perspicuously realise it. Hence performances of the *Well-Tempered Clavier* on a piano, on a harpsichord, by a quartet of brass or woodwind, or by the Swingle Singers are all performances of the *Well-Tempered Clavier*'. He contends that we attend to the sounds of music solely as sounds, without regard to their origins.[5]

Formalists point to the following as supporting their view: some works, such as Bach's *Art of Fugue*, have no specified instrumentation. Others, such as Percy Grainger's *Irish Tune from County Derry*, are indicated as for

any instruments. It is common for works to be transcribed for instruments other than those for which they were written or to exist in different orchestral arrangements, and they remain recognisable despite such transformations.

Two lines of reply can be pursued against the musical formalist. We can argue, as I did above for paintings, that a work's instrumental colour often makes a vital contribution to structural and other features. It helps delineate form and can add expressive and depictive qualities that are central to the work's character and identity. In addition, the formalist's assumption that nothing outside the work is relevant to its identity can be questioned. Aspects of the art-historical context and tradition in which the work was created affect its contents and its identity.[6] For instance, a work's genre determines which of its properties are standard, contra-standard, and variable, and thereby affects its work-identifying contents.[7] Meanwhile, what genre it belongs to depends both on the composer's intentions and on its matching the established genres of the time.

Recognising what is achieved in the work involves consideration of the constraints its media impose. In the musical case, the medium is not that of pure sound, but of sounds elicited by human musicians from their own body or from devices made of wood, metal, bone, gut, horsehair, and so on. In other words, and here is the second argument, the musical medium is the voice or musical instruments the use of which is specified by the work's composer. Typically, the work's instrumentation is not an incidental means to the sounding of the work. Rather, the use of those instruments is integral to the production of properly formed instances of the work. Even if a work is recognisable when performed in ways that alter or ignore its intended orchestration, such a performance is not properly formed or fully authentic. Meanwhile, transcriptions are distinct though derivative works or, in other

cases, works can have more than one version, with each being instrument-specific.[8]

Colourful Formalism

A formalist might be persuaded by the first line of argument—instrumental colour contributes essentially to the work's identity—but not by the second—according to which the relevant timbres must be elicited from the voices or the instruments specified by the work's composer. This formalist maintains that nothing beyond its timbrally inflected sound determines the work's identity, and he therefore suggests that the use of the specified musical instruments is not required in producing a fully authentic instance of the work. I have called this position 'timbral sonicism'.[9] The timbral sonicist develops his view as follows: for a long time, we associated the sounds with the instruments that produced them because there was no practical alternative to employing those instruments if one wanted to generate the specified sounds with the indicated timbral qualities. Now, though, we have the technology not only to record and replay such sounds but also to synthesise them electronically. An electronically generated rendition of a work would be fully accurate and authentic provided it matches the appropriate note pattern and invests this with the relevant timbral qualities—the sounds *as of* the instruments specified by the composer—despite the fact that the rendition is not performed by singers or by musicians playing the indicated instruments in the usual fashion.

Timbral sonicism has been defended recently by Julian Dodd. He states its thesis as follows: 'a work's normative properties comprise merely acoustic properties and not, in addition to these, *performance-means properties*: properties concerning how a performance's constituent sounds are produced'.[10]

Dodd begins by laying claim to the conceptual high ground: timbral sonicism is the theory we should accept unless it is defeated. And he suggests that the arguments of those he calls 'instrumentalists'—that is, those who regard the composer's specification of the performance-means as normative and thereby as indicating what is required for a fully authentic performance—as insufficient to defeat timbral sonicism.

In defence of the first claim, Dodd holds: 'There is something deeply intuitive about the idea that works of music are pure types of sound-event: in other words, that what makes a certain work *that* work is simply that its performances should sound like *that* … Someone unencumbered by developments in analytical aesthetics will most likely accept that a performance of the *Hammerklavier* on a Perfect Timbral Synthesiser, indistinguishable to the ears from a performance on a piano, would be a no less satisfactory presentation of the piece'.[11] He affirms that the way we experience music is as connected sounds, not in terms of their sources, even if we typically refer to those sources as a way of indicating the precise timbral quality that we experience.

Turning to his rejection of arguments against timbral sonicism, Dodd notes that we cannot infer from the composer's specification of the work's instrumentation and her use of instrument-specific notations, such as *pizzicato*, that it is the use of those instruments, as against a sonic profile as of those instruments, that is normative for her work. And even if composers think in terms of the instruments to be used and take their work-establishing intentions to target those instruments, not merely their sounds, they would be mistaken in believing that they thereby mandate the use of those instruments in faithful performances. Moreover, even if it is true, as Stan Godlovitch has argued,[12] that musicians belong to guilds that allow changes to instruments only if these

preserve central skill elements and that these guilds reject synthesisers as replacement technologies, the musical ontologist can remain unimpressed. It would be a mistake to elevate an observation about the social history of music making into a constraint on clear-headed ontologising, Dodd suggests. 'That the practice of musicians embodies a commitment to instrumentalism does not entail that this doctrine is correct'.[13] If the performer uses replacement technology to produce a version of the *Hammerklavier* that is sonically indistinguishable from that of an accurate performance on the piano, we might think she 'cheats' in that she does not display the skill needed to elicit the work from a piano in the standard manner, but that is a judgment of the performer, not of the authenticity of the performance that is produced. Similarly, qualities that implicate the means of performance, such as that of being virtuosic, belong to the performer or performance, not to the work as such. And works are not unusual or original in terms of their use of instruments. Rather, it is the composers of such works and their compositional acts that display such characteristics. Meanwhile, properties that genuinely do belong to the work by virtue of its timbral qualities, such as some expressive properties for instance, do not depend on the means by which those timbral qualities are produced. And if, nevertheless, audiences no longer hear the same gestural or expressive qualities in the sound of the Perfect Timbral Synthesiser, that is 'caused by a failure of imagination on their part: a failure to hear the sounds *as if* made by' the ordinarily expected instrument.[14]

I hope it is clear by now that Dodd awards himself an invincible position. If the relevant properties cannot be heard, they must belong not to the work but to the composer, the performer, the social history of music making, the performance tradition, or whatever. And if they can be heard, so that they belong to the work, it must be that their being heard does not presuppose

anything about the sound's provenance. Moreover, we cannot appeal to what composers intend, musicians expect, and listeners experience when objecting to timbral sonicism, because Dodd offers an error theory, according to which composers, musicians, and listeners are liable to be wrong in their beliefs about the relevant matters. When composers intend to require performers to use the specified instruments, they are in error. Performers who think they can establish standards of authentic performance in terms of the musical skills involved in using the specified instruments are also mistaken, as are listeners who, through a failure of imagination, feel that something is lacking in the rendition given by the Perfect Timbral Synthesiser. Dodd's stance makes his position unfalsifiable. And because of his opening assumption, that the onus of proof is not on him but on his opponents, timbral sonicism is guaranteed to triumph.

The Perfect Timbral Synthesiser

The issue is not whether the rendition by the Perfect Timbral Synthesiser provides epistemic access to how an authentic performance would sound. It does. Nor is it about whether we might counterfactually entertain the thought that what issues from the Perfect Timbral Synthesiser is the sound of some performance. We might do so and, in a world without pianists who can play the *Hammerklavier*, could fruitfully use the Perfect Timbral Synthesiser as a prop in such an imaginative game. Instead, the debate is over whether the Perfect Timbral Synthesiser povides a fully complete and faithful performance of the *Hammerklavier*. Dodd thinks it does. It preserves all the properties constitutive of the work, he insists. I disagree.

Here are my intuitions on the Perfect Timbral Synthesiser's rendition: I am reluctant to regard the result as a performance, because the actions characteristic of performing the *Hammerklavier*, over nearly two hundred

years, do not take place. Moreover, the sounding produced by the Perfect Timbral Synthesiser is deficient in its representation of Beethoven's sonata; it lacks some of the features that are constitutive of Beethoven's work. One of these is the virtuosity of the last movement. (If control of the Perfect Timbral Synthesiser is difficult to master, eliciting from it a sounding of the *Hammerklavier* may call for a degree of virtuosity, but not exactly of the sort Beethoven intended.) Unlike Dodd, I see no reason to think that virtuosity belongs exclusively to the performer or the performance, as opposed to the work. It is a characteristic of the work that it is technically demanding of the pianist who would perform it. In addition, the human warmth of performance is missing from the electronically generated sounding, and this affects expressive and other features that belong to the work. If I may quote myself:

> 'For the accomplished player, the instrument is experienced as an extension of the body, as continuous with it. Just as a walking stick projects its user's boundary, because the ground is felt at its tip, so the musical instrument extends the boundaries of the person who plays it. And this expansion is emotional and personal, as well as physical, to the extent that the instrument provides the player with new means for expressing her ideas, personality, and passions. This nexus of corporeal embodiment, action, and expression is melded indissolubly with the music that is sounded, which in its turn implicates the human body and organic processes through the ebb and flow of its pulse and rhythm, of its gestures and sighs, of its tensions and resolutions'.[15]

The person who listens as the Perfect Timbral Synthesiser outputs the *Hammerklavier* will not hear in it the gestural and expressive actions that

properly belong to it if she remains aware throughout that the Perfect Timbral Synthesiser generates its sounds according to some program the authoring, installation, and execution of which involves something other than real-time piano playing.

Timbral Sonicism Tested

It is instructive to note how profound and tenacious are the tendencies Dodd diagnoses as error-prone. The thought of music as the auditory bodying forth of human action is deeply ingrained.

The spatial layouts of instruments as diverse as Afghanistan's dutâr, the African thumb piano, and the blues guitar condition the music created by performer-composers, suggesting that musical cognition may involve thinking in terms of movement, of how the hands engage the instrument, not only of sound.[16] Moreover, the relevant motor regions of the brain are stimulated when musicians merely imagine playing.[17] As well, the sight of musicians playing contributes to the listener's recognition and experience of music's expressive qualities.[18] Neurological scans show that, even in passive listening, music stimulates the parts of the brain that are involved in motor activation and vocal sound production.[19]

These data suggest that it is not merely the accident of association that leads us to think of sounds in terms of their sources. Indeed, wider consideration of the evolutionary function of our senses suggests that, rather than being concerned primarily with what impinges directly on the ears, and then with what causes this only by association, their adaptive function is to provide knowledge of those sources. Our senses evolved to provide us with information about the world that is relevant to our survival. To do so effectively, they must tell us the nature of distant causes through providing sensory awareness of their proximal effects. Accordingly, we generally

experience not the qualities of the sound we are sensing but the physical properties of its source. In other words, we register changes in the sound as changes in the cause of the sound. For example, if a percussionist strikes his instrument with decreasing force, rather than following the subtle, complex acoustic changes that occur we hear the change in the force with which the instrument is struck.[20] The evidence of the past decade of empirical research by musicologists and psychologists is widely interpreted as supporting the conclusion that listeners perceive not 'pure' sounds but their sources.[21] All this suggests that Dodd's claim that timbre is a property solely of a sound, rather than of a voice or a played instrument, is as weird as saying that colour is solely a property of light, rather than of the object from which the light is reflected.

I suppose Dodd will dismiss such considerations as illegitimately substituting study of the psychology of the experience of music for ontological analysis, as he does also in rejecting the sociological claims made by Godlovitch. Yet these data are surely relevant to how we should assess his assertion that the burden of proof lies exclusively with his opponent. The intuition that musical works are sound-events is certainly widespread, but not that they are *pure* sound events. Rather, the standard intuition is that they are the outcome of specific kinds of actions that engage or impinge upon particular kinds of sound-generators. Dodd can deal with this reality only by arguing that composers, musicians, and many listeners are systematically mistaken about what they experience when they appreciate musical works for what they are. What is deeply intuitive to Dodd is not deeply intuitive to others, however. It is simply not true, I think, that everyone (except those 'encumbered by the developments in analytical aesthetics') will accept that a performance of a Schubert song on an appropriately programmed Perfect

Timbral Synthesiser, indistinguishable to the ears from a performance by a vocalist accompanied by a piano but not involving either, would be 'a no less satisfactory presentation of the piece'.[22]

When we call into doubt Dodd's claim that timbral sonicism is the default position that wins unless it is defeated, his subsequent arguments seem to beg the ontological question. As I observed earlier, he makes his position unfalsifiable by assuming that timbral sonicism must be able to accommodate all that is necessary, and that what it cannot cover can thereby be judged not to be relevant to the musical work's identity.

I believe also that Dodd is mistaken in believing that the issues of musical ontology should or could be quarantined from the sociological and psychological concerns he dismisses as solely epistemological, as I now explain.

We are capable of distinguishing fine shades of timbral difference, and we sometimes value those differences. A Stradivarius has a different tone and sounds better than a cheap violin, though both sound unmistakably like violins. A Steinway grand piano is similarly different in tone from a mass-produced upright that is, nevertheless, unquestionably a piano. However, a performance of a violin concerto is not inauthentic as a result of being played on a mass-produced violin, not a Stradivarius, and a piano sonata is not performed less faithfully on an upright piano than on one branded as made by Steinway. In addition, composers have often matched their music to the distinctive timbral and other sonic features of individual performers. Mozart wrote the Queen of the Night's music to highlight the coloratura abilities and tessitura of Josepha Hofer. Béla Bartók wrote for the violinist Joseph Szigeti, who played with a distinctive, metallic tone. Despite this, we allow that any sufficiently skilled soprano or violinist can perform Mozart's or Bartók's music

in a fully authentic fashion, though the result does not faithfully reproduce the timbral specificity that these composers had in mind. In other words, we regard the relevant pieces as for the soprano and the violin, not solely for Hofer or Szigeti. These observations invite the question: given that timbre counts among the work's identifying features, why does it count only so much and not more, despite the composer's more detailed timbral conception of the music and our capacity to discriminate relevant timbral subtleties?[23]

It seems to me that there are two fairly obvious answers to this question, neither of which can be congenial to the timbral sonicist. The first notes that works are almost always specified at the level of instrument-types (bass viol, snaredrum, clarinet, serpent, sackbut), without regard to individual (usually subtle) differences between instances of any given type. This is because works of the kind in question are supposed and acknowledged to be for multiple performances, with different performances involving different musicians and orchestras. So, once again, reference to the means of performance is implicated in the musical work's identity, not sound qualities alone.

The second answer goes further. The level of timbral detail that is work-constitutive depends on social conventions adopted within the relevant musical tradition of work creation and presentation. In other words, the standard might have been set higher, and probably would have been if there had been less regularity among musical instruments and a greater valuing of idiosyncratic instruments. Or it could have been set lower, with considerable discretion allowed to performers in the choice of the work's instrumentation without consequent loss in the faithfulness of their performances. Indeed, this seems to be the case in jazz. For classical music, the eventual standardisation of orchestras and instruments (across broad limits) allowed the best of both

worlds: highly portable and repeatable works that are, nevertheless, rich in timbral qualities that make a significant expressive and structural contribution to the work's interest. Within contrasting socio-historical practices or musical traditions, the situation could be very different, however. For example, as purely electronic works show, there could be works in which timbre is significant but the instrumental means for performance are replaced by automated mechanisms for playback.

Lessons for the Ontology of Music

Dodd dismisses the human factor as irrelevant, as if he is dealing with the ontology of a natural kind. He writes of music as if it possesses a universal and unchanging essence. That is, he writes as if what we believe about musical works, how we respond to them, and how our social practices and histories incorporate them are irrelevant to the kind of things they are, just as a ruby is what it is even if humans believe it to be the frozen blood of the gods. That approach may be appropriate for rubies but is not appropriate for musical works and other socially contextualised items identified as human creations.

Because musical works are human creations, the sociology and psychology of music—what composers intend, what musicians do, and what listeners prefer, along with the interpersonal arrangements that emerge from or are based on such intentions, actions, and preferences—are relevant to an account of the character of the musical works that are made. Consideration of such matters is not, as Dodd suggests, a turning away from metaphysics. It is, instead, the adoption of a metaphysics that is appropriately informed by relevant data from social and musical history, as Dodd's abstract metaphysics in the formalist mode is not.

The second answer given above to the question asking why timbre counts only so much and not more indicated that there is a degree of cultural

flexibility to our characterisation of musical works. In turn, this implies the possibility that the ontological nature of musical works is mutable, being responsive to changes in the socio-musical environment.

The history of Western classical music and its associated practices clearly indicate that the ontological character of musical works is flexible in the way just suggested. In the past, when orchestras and instruments were not uniform and works were adapted for local circumstances, the conventions of performance did not treat all of a composer's indications or intentions as regards the means of performance as among her work's identifying features. Vocal music and songs did have to be sung for a fully faithful rendition, but the performers could and often did substitute what they had in the way of instrumental resources for the instrumentation the composer intended and preferred. (Also, they had much more editorial discretion than was allowed later.) However desirable it was from an aesthetic point of view to meet the composer's wishes as regards the performance-means, a performance was not less faithful to the work if these were bypassed. Not surprisingly, under such circumstances composers were less liable to invest their works with instrument-specific timbral effects, except where the instruments were very widespread and similar, as was true for the lute in the fifteenth century and the violin in the seventeenth. Performances of music were replete with timbral effects, of course, but most of these were attributable to the performer as part of his individual interpretation, not to the composer as part of her work's identifying features. Beginning in the eighteenth century, the performer's discretion in the selection and use of performance-means gradually diminished, following the publication of scores, the regularisation of the orchestra, and moves toward professional, public performance. By the nineteenth century, the practice of Western classical music's performance

suggested that the work's instrumentation, and hence its colour, was mandated by its composer. In other words, changes in musical practice and reception over time shifted timbral effects from the sphere of the performer's interpretative freedom to the sphere of the work's constitutive properties, and this was achieved via an equivalent change in the status of the composer's indication of the work's performance-means, from recommendations for best interpretative practice to work-identifying directions.

In acknowledgment of this, I reject not only pure sonicism and timbral sonicism but also thoroughgoing instrumentalism. There have been periods or genres in which instrumental colour was more a feature of the performance than a constituent of the work performed. This was typically the case when convention and the default circumstances made it impossible for composers to require what performance-means could be employed in realising their works. And in addition, technology has allowed for the creation of purely electronic works issued on discs. Such works are for playback, not performance, which means that instrumentalism is not an appropriate ontological model for them.[24] So, instrumentalism fails if it is presented as a timeless or overarching theory.

Musical works come in a variety of ontological types. I have argued that works for live performance, works for studio performance, and works for playback (such as purely electronic compositions that are not for performance) should be distinguished.[25] And among those for performance, works can be variously 'thick' or 'thin' with constitutive properties. A work with mandated, detailed instrumentation will be thicker than one designated as for performance on any instruments, even if the latter's sound-structural profile is otherwise identical to the former's. (Even if a group performs the second work with the instruments specified for the first, with the result that their performance is sonically indistinguishable from a rendition of the first, timbral

features belonging to the first work in its performance are, in the performance of the second, attributable only to the interpretation offered, not to the piece.) The ontological analysis of the nature of musical works must respect this diversity. To do so, account must be taken of how the circumstances and practices of the time of the work's creation are relevant to its nature. Rarefied, monolithic theories, like Dodd's timbral sonicism, traduce the rich variety in music and its works.[26]

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ENDNOTES

1 Realistically coloured representations (such as a painting of green grass) stimulate the colour region of the brain differently from depictions that are aberrantly coloured (such as paintings of purple grass); see S. Zeki, 'Art and the Brain', *Journal of Consciousness Studies: Art and the Brain*, vol. 6, (1999), pp. 76-96.

2 For further discussion, see S. Irvin, *Work and Object: The Artist's Sanction in Contemporary Art*, (Doctoral dissertation, Princeton University, 2003).

3 'A Theory of the Compositional Work of Music', *Journal of Aesthetics and Art Criticism*, vol. 33, (1974), pp. 59-66.

4 'Orchestrating Platonism', in *Aesthetic Distinction*, T. Anderberg, T. Nilstun, & I. Persson (eds.) (Lund: Lund University Press, 1988), pp. 42-55; quotation from p. 55.

5 *The Aesthetics of Music* (Oxford: Clarendon Press, 1997); the quotation is from p. 442 and the thesis is developed at pp. 2-3,19-20. For discussion of Scruton's view, see A. Hamilton, 'The Sound of Music', in *Sounds and*

Perception: New Philosophical Essays, M. Nudds (ed.) (Oxford: Oxford University Press, forthcoming).

[6] See J. Levinson, 'What a Musical Work Is', 'What a Musical Work Is, Again', and 'Authentic Performance and Performance Means', in *Music, Art, and Metaphysics* (Ithaca: Cornell University Press, 1990), pp. 63-88, 215-63, and 393-408; see also S. Davies, *Musical Works and Performances: A Philosophical Exploration* (Oxford: Clarendon Press, 2001).

[7] K.L. Walton, 'Categories of Art', *Philosophical Review*, vol. 79, (1970), pp. 334-67.

[8] See S. Davies, 'Transcription, Authenticity and Performance', in *Themes in the Philosophy of Music* (Oxford: Oxford University Press, 2003), pp. 47-59 and 'Versions of Musical Works', in *Philosophers on Music: Experience, Meaning and Work*, K. Stock (ed.) (Oxford: Oxford University Press, 2007), pp. 79-92.

[9] *Musical Works and Performances*, p. 64.

[10] J. Dodd, 'Sounds, Instruments and Works of Music', in *Philosophers on Music: Experience, Meaning and Work*, K. Stock (ed.) (Oxford: Oxford University Press, 2007), pp. 23-51; the quotation is from p. 25. The most developed version of his position is in his *Works of Music: An Essay in Ontology* (Oxford: Oxford University Press, 2007).

[11] 'Sounds, Instruments and Works of Music', pp. 26-7.

[12] *Musical Performance: A Philosophical Study* (London: Routledge, 1998).

[13] 'Sounds, Instruments and Works of Music', p. 36.

[14] 'Sounds, Instruments and Works of Music', p. 45.

[15] 'What is the Sound of One Piano Plummeting?' in *Themes in the Philosophy of Music* (Oxford: Oxford University Press, 2003), pp. 108-18; the quotation if from p. 114.

[16] See J. Blacking, 'Patterns of Nsenga *kalimba* Music', *African Music*, vol. 2, (1961) (4), pp. 26-43; J. Baily, 'Movement Patterns in Playing the Herati Dutâr', in *The Anthropology of the Body*, J. Blacking (ed.) (London: Academic Press, 1977), pp. 275-330, and 'Music Structure and Human Movement', in *Musical Structure and Cognition*, P. Howell, I. Cross, & R. West (eds.) (London: Academic Press, 1985), pp. 237-58; V.S. Iyer, *Microstructures of Feel, Macrostructures of Sound: Embodied Cognition in West African and African-American Musics*, (Doctoral dissertation, University of California, 1998), and 'Embodied Mind, Situated Cognition, and Expressive Microtiming in African-American Music', *Music Perception*, vol. 19, (2002), pp. 387-414; and S. Nelson, *Melodic Improvisation on a Twelve-bar Blues Model: An Investigation of Physical and Historical Aspects, and their Contribution to Performance*, (Doctoral dissertation, City University of London, 2002).

[17] See R.J. Zatorre & A.R. Halpern, 'Mental Concerts: Musical Imagery and Auditory Cortex', *Neuron*, vol. 47, (2005), pp. 9-12.

[18] See J.W. Davidson, 'Visual Perception of Performance Manner in the Movements of Solo Musicians', *Psychology of Music*, vol. 21, (1993), pp. 103–12; B. Vines, C. Krumhansl, M. Wanderly, I. Dalca, & D. Levitin, 'Dimensions of Emotion in Expressive Musical Performance', *Annals of the New York Academy of Sciences*, vol. 1060, (2005), pp. 462-66.

[19] See P. Janata & S.T. Grafton, 'Swinging in the Brain: Shared Neural Substrates for Behaviors Related to Sequencing and Music', *Nature Neuroscience*, vol. 6, (2003), pp. 682-7; S. Koelsch & W.A. Siebel,

'Towards a Neural Basis of Music Perception', *Trends in Cognitive Sciences*, vol. 9, (2005), pp. 578-84; S. Koelsch, T. Fritz, D. Yves, V. Cramon, K. Müller, & A.D. Friederici, 'Investigating Emotion with Music: An fMRI Study', *Human Brain Mapping*, vol. 27, (2006), pp. 239-50.

[20] See A.S. Bregman, *Auditory Scene Analysis: The Perceptual Organization of Sound*, (Cambridge, MA: MIT Press, 1990). For further discussion along the same lines, see E.F. Clarke, 'Structure and Expression in Rhythmic Performance', in *Musical Structure and Cognition*, P. Howell, I. Cross & R. West (eds.) (London: Academic Press, 1985), pp. 209-36, and *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (New York: Oxford University Pres, 2005); J.J. Gibson, *The Senses Considered as Perceptual Systems* (London: George Allen & Unwin, 1968); S. Handel, *Listening: An Introduction to the Perception of Auditory Events* (Cambridge, MA: MIT Press, 1989); P. Shove & B.H. Repp, 'Musical Motion and Performance: Theoretical and Empirical', in *The Practice of Performance: Studies in Musical Interpretation*, J. Rink (ed.) (Cambridge: Cambridge University Press, 1995), pp. 55-83; N.J. Vanderveer, 'Ecological Acoustics: Human Perception of Environmental Sounds', *Dissertation Abstracts International*, vol. 40, (1979), 4543B; and W.L. Windsor, 'Through and Around the Acousmatic: The Interpretation of Electroacoustic Sounds', in *Music, Electronic Media and Culture*, S. Emmerson (ed.) (Aldershot: Ashgate, 2000), pp. 7-25.

[21] See N. Dibben, 'What do We Hear when We Hear Music? Music Perception and Musical Material', *Musicae Scientiae*, vol. 5, (2001), pp. 161-94.

[22] 'Sounds, Instruments and Works of Music', p. 27.

[23] Note that the instrumentalist also faces the same troublesome query. I have suggested (*Musical Works and Performances*, pp. 66-8) that Levinson, who defends the view that the use of the indicated performance-means is needed for a performance to be fully faithful to the work, fails to address this issue.

[24] Dodd's timbral sonicism would apply more readily to compositions generated not by sampling 'real' sounds but instead by purely electronic means. We approach such works as timbrally inflected sound structures without considering or being fully aware usually of the procedures that affect the timbral and other qualities of the sounds. But Dodd intends his theory specifically to characterise traditional works, such as the *Hammerklavier*, that were intended for performance on acoustic instruments.

[25] For critical discussion of my attempt in *Musical Works and Performances* to separate live from studio performances, see A. Kania, 'Making Tracks: The Ontology of Rock Music', *Journal of Aesthetics and Art Criticism*, vol. 64, (2006), pp. 401-14.

[26] For their helpful suggestions, I thank Sherri Irvin, Andrew Kania, and Joe Moore.