Making and Hearing Meaning in Performance

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Introduction

It has been conventional to study and discuss expression in music performance as if the primary role of the performer was to act as a 'channel' conveying musical meaning from the score (or perhaps the intentions of the composer inferred from the score) to an audience (see e.g. Berry 1989; Clarke 1988). It has certainly also been recognised that performers have their own role and 'voice' in this process, and that while the ideal of being a self-effacing and transparent channel might be an aesthetic ideal in some performance traditions (for a discussion see Mellers 1992; Clarke 2002), elsewhere it is expected that performers will not only leave their mark on a performance, but more radically should be regarded as the prime mover in whatever music results: in improvised traditions, for example, there really is no alternative (see Clarke 2005a). In this paper, I present a somewhat different approach to musical meaning in performance, considering the question first from the perspective of what performers do when they perform, and the performer's production of meaning; then from the perspective of listeners and what it is that they hear in performance; and finally in the context of a recent collaborative empirical project, focused on the commissioning, rehearsal and performance of three new works for solo piano and involving the active research participation of the performer and composers, which raises some interesting questions about interpretation, communication, and notation.

The production of performance
Motor Skill and the Body

Playing music engagingly, in almost any idiom, is an impressive and remarkable human achievement that requires a complex combination of physical, cognitive, emotional and social skills. Until recently, the overwhelming bulk of the published research has focused on the first two of these categories (physical and cognitive skills) with increasing attention now being paid to emotional and social components in performance. A primary reason for this particular orientation within earlier work was that most of the initial research on performance was the work of psychologists who were understandably fascinated by the motor and more general cognitive skills of expert musicians. In the context of standard laboratory tasks (or indeed in almost any context), an expert musician's ability to control movement, timing,

and coordination, and to assimilate and process large amounts of complex information from a visual source (the score – since virtually all of this work was firmly with the Western classical tradition) represents a considerable challenge to psychological explanation. Henry Shaffer's pioneering work (e.g. Shaffer 1976; 1981; 1984) on piano playing, studying performances of music by Bach, Bartók, Beethoven and Chopin in unprecedented detail, took as its central focus a consideration of timing mechanisms, the control of movement, and coordination between hands and separate players. This kind of research focuses on how expert players achieve what they do, regarding the body and its primary cognitive and motor attributes, as a means to an end – that 'end' being the rather more abstract musical goals of successful performance.

But although performers have to work and struggle to achieve the technical expertise with their instruments or voices that contemporary professional musical culture demands of them, it would be wrong to regard the physical component of performance only as a hurdle to be overcome. The physical aspect of playing music is also a source of pleasure – at times in quite a hedonistic sense – and an aspect of performance that instrumentalists deliberately exploit. For example, in a study of pianists' fingering strategies (Clarke, Parncutt, Sloboda and Raekallio 1997) one of the participants described how he particularly enjoyed the feeling of using his thumb, and that he found ways specifically to use it even when it wasn't the most obvious 'ergonomic' solution to fingering a passage. This is a relatively small-scale example of a phenomenon that almost every instrumentalist must know, and which can certainly be observed in the behaviour of accomplished performers: the apparently simple physical pleasure of interacting with the instrument in a controlled and fluent manner.

I say apparently simple, because there seems to be an interesting and rather more complex inter-relationship between person, instrument, and musical goal than might appear at first sight. Part of the physical pleasure in performance is bound up with the sense of control and accomplishment over an instrument that at other times will seem, or will have seemed, almost unbearably uncomfortable or uncooperative (to use an anthropomorphism). Learning to play an instrument, before having achieved a reasonable level of technical competence, can be a frustrating and physical uncomfortable experience. But there is also an important sense that this feeling of harnessing and controlling the

instrument-in-relation-to-the-body is particularly rewarding and pleasurable by virtue of the musical ends which are served. I am aware in playing the violin, for instance, that the physical ease and pleasure in playing a technically undemanding passage in G major (a rather 'comfortable' key for the violin) is heightened when that direct, physical quality is part of a larger context in which the auditory/musical component is itself pleasurable. For example, the second violin part of the slow movement of Haydn's string quartet Op. 76 no. 3 (the 'Emperor' quartet) is just such a technically undemanding part in G major, but contributes to a passage of music that I very much enjoy as music. When I play this movement, I am aware that what seems like the directly physical pleasure of engaging with the instrument is intensified by the music-making to which it contributes. It is a piece that I like very much, and which I knew as a listener before I knew it as a player, and it is the interaction between the directly physical experience of playing it, and the auditory/cognitive experience of taking part in making that piece of music come into sonic existence, that is so pleasurable.

There is also the pleasure of straightforward instrumental athleticism: one only has to watch a technically expert soloist playing the Sibelius violin concerto, for instance, or rattling off a Paganini caprice as an encore, to see just how much fun it can be simply to get around the instrument. The Kreutzer studies – which are mostly pretty vacuous in an abstractly musical sense – can be torment for violinists acquiring their technique, but great fun in the sense of pure physical accomplishment for an expert. The whole domain of music performance as physical play, and of the physical pleasures of that play, and the interactions between physical and creative pleasure, is a potentially fascinating area for future research, and one which has so far hardly been touched (though see Baily 1985, Lidov 1987, Clarke and Davidson 1998, and Sudnow 2001 for four rather different approaches to the relationship between music and the body).

Expression

The most intensively studied aspect of music performance is expression, which occupies a central place in performance research. A typical example is provided by the analysis of two performances, by the same professional performer on the same day, of the Chopin prelude in E minor, op. 28 no. 4 discussed in Clarke 1995. The analysis shows that the two performances show different

patterns of timing and dynamics, both of which display highly systematic properties. In this and most other studies of this kind, the question of how to account for these systematic patterns has turned towards structural properties of the music as the primary source of explanation, on the basis that the performer acts as a 'parser' whose role is to assimilate and make sense of the structural information embodied in the score, and then to find a convincing way to articulate that structural interpretation using the resources of the instrument. The existence of different accounts of the same music is then often attributed to different interpretations that are afforded by the score, as is the case in the Chopin analysis (Clarke 1995) mentioned above.

After a period in which the relationship between structure and expression dominated as the principal, if not sole, explanatory framework, there has now been a decade or more in which the roles of motion and emotion have become increasingly recognised as similarly important factors. Studies of body movement (e.g. Davidson 1994, 2002; Shove and Repp 1995) and of emotional intentions in performance (e.g. Gabrielsson and Juslin 1996; Juslin 1997, 2001) have demonstrated the impact of these less abstract factors on performance, and in a substantial and important attempt to bring together the potentially disparate components that are increasingly recognised within expressive performance, Juslin and colleagues (Juslin, Friberg and Bresin 2001–2; and modified in Juslin 2003) have proposed a multi-component model (with the acronym GERMS) that co-ordinates these different elements. Figure 1 shows the general outlines of this proposal, and illustrates the appealingly simple way in which a range of factors is brought together. The model applies specifically to score-based music (though it would be relatively straightforward to modify it for an aural/oral tradition), and the score acts as the source for both a structural interpretation of the music and what Juslin calls a mood interpretation – a kind of abstract emotional representation or narrative. These two interpretations then form the inputs into two sets of expressive principles (generative/structural and emotional respectively) that determine the shaping of whatever performance parameters are available on the particular instrument or voice (timing, dynamics, vibrato, articulation, intonation, pedalling, etc.). The influence of the physical body and instrument, and of stylistic awareness on the part of the performer, also feed into this central expressive representation, once again by leaving their mark on the same parameters of performance. The body/instrument component does so in a directly
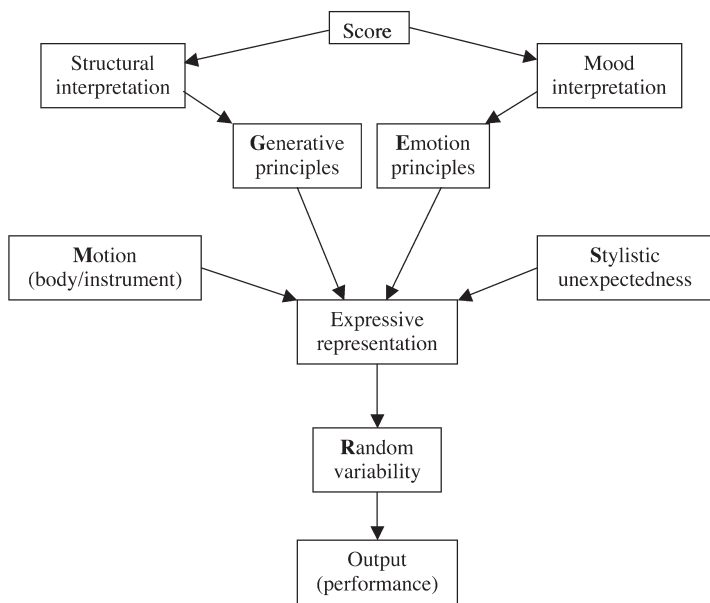
Figure 1. Schematic outline of the GERMS model, adapted from the figure presented in Juslin, Friberg and Bresin 2001–2, and incorporating modifications discussed in Juslin 2003.

physical manner, while 'stylistic unexpectedness' is conceived as a rather more cognitive factor: performers are aware of the kinds of musical processes and expressive treatments that are typical or conventional in any style, and play with this more-or-less shared 'common knowledge' by either conforming to, or thwarting, those expectations. Based on a long tradition of theorising that associates emotion and meaning with the denial of expectations (e.g. Meyer 1956), it is the unexpected in performance that makes a particular contribution to expressivity.

Finally, this rather idealised expressive representation is filtered through the less-than-perfect motor apparatus of the human body, which introduces random variability into the resulting output. Seen from one point of view, this random variability is an imperfection in the system that one might ideally want to eliminate, but it brings with it the benefit of a characteristic indeterminacy that seems to confer an important sense of 'human-ness' on the sound of a performance – as the manufacturers of drum machines and sequencers discovered when for the first time people (programmers) were able to produce quantized musical sequences that did not contain any of that 'noise' and jitter. Those same manufacturers were quick to introduce randomize or 'shuffle' features to put back some of the human quality that listeners missed. Too

much random variability is obviously something that performers try to control, and this is part of the point of practising and developing technical skill on an instrument. In his more recent development of the model, Juslin (2003) has described the aim of most performers as being to move from a GERM model (in which randomness does play a part, and stylistic unexpectedness has not yet been incorporated) towards a GEMS model, in which randomness is minimised (if not quite eliminated) and stylistic unexpectedness (which gives a performer a distinctive style) is acquired.

In summary, after a period in which there was arguably too great a concentration on the relationship between structure and expression, to the detriment of an understanding of the role of other factors, research has now moved into a more broadly encompassing phase, in which a number of other sources of, and influences upon, expression have been considered – and have begun to be integrated. A limitation of all of this work is that while it has contributed to a progressive understanding of the factors involved in an acceptable expressive performance, it sheds little light on what characterises a striking or exceptional performance. Juslin's incorporation of a principle of 'stylistic unexpectedness', and the idea captured in the GERM to GEMS shorthand, are moves in that direction, but the overwhelming emphasis within the performance literature (and arguably of psychology more generally) is on finding models or explanations of normative behaviour – and, as noted before, an abiding principle within theories of expression is the importance of departures from a norm of some kind. What made Jimi Hendrix or Glenn Gould remarkable performers was the individuality of their approach – and the sound that it made. There is a fine line, however, between this expressive originality and what might seem to be an arbitrary or wayward flouting of the norms, which can easily just sound like incompetence or incomprehension. Psychological research still has comparatively little to say about what it is that places a phenomenon on one or the other side of that line, and it is clearly a question that is as much to do with listeners' previous experiences and expectations as it is with describable (let alone measurable) properties of the performance. In the context of a study examining listeners' preferences for individual versus artificially constructed average performances, Repp (1997) has discussed this question in terms of the conflict between the need to communicate on the one hand, which depends on adherence to generally shared conventions;

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and the need to assert a performing identity on the other, which depends on creative transformation or transgression of those conventions (for further discussion see also Clarke 2005a). In the end, perhaps this goes beyond what psychology can be expected to explain and becomes a question that is more about the history of culture - since the idiosyncrasies of one cultural or historical context can become the norms of another.

I have made the case elsewhere (Clarke 2005b) for understanding the perception of musical meaning in terms of principles derived from ecological psychology, and some of the same theoretical framework may be a useful way to think about performance too. A musical work, or simply a set of musical norms and conventions (in the case of an idiom not based on works) can be thought of as a particular kind of environment that affords certain kinds of performing opportunities. Other important parts of that environment are the instrumental and technological resources available, the type of venue and occasion, and the other performers (if any) that are involved. Complementing these affordances are the performer's own 'effectivities' (see Shaw, Turvey and Mace 1982; Turvey 1992; Chemero 2003), which can be regarded rather approximately as that person's abilities. Any particular performance is then a specific activation of these complementary affordances and effectivities. Expressed like this, the description seems unhelpfully abstract, but an advantage of theorising performance in this way is that it helps to show how the meaning of a performance arises from a potentially large number of interacting sources. To take a concrete example, let's imagine a 10 year old violinist involved with other children in a performance of Pachelbel's canon in D major. As defined by its representation in a score, and in the context of the instruments and players available (violins and cellos, and other children) the piece will have various affordances, such as 'coordinated string playing' or 'baroque performance' or 'legato playing' – but not (for instance) 'wild extraversion' or 'modernist angst'. If the occasion and venue are a concert at the end of a youth music course, held in a school hall, and the audience is mostly friends and relatives, then a primary meaning of the performance might be 'demonstration of accomplishment' or even 'virtuosity' (given the age of the performers) – something that would not be true of a performance by professional adult performers. And if the 10 year old player was to use rather more vibrato, and to play with a louder dynamic during a certain passage, the meaning of those expressive actions could be 'showing that I can play this bit really well',

or 'return of the main tune', or 'helping another violinist to keep his place'. It is beyond the scope of this paper to explore the ramifications of this approach, but what I hope to have demonstrated is that expression in performance is the construction of meaning by performers in the specific circumstances of the musical materials and instrumental resources at their disposal; the venue, occasion and audience; and the players' skills and sensitivities. Because of the particular focus of previous psychological research (the Western score-based tradition, expert adult performers, and 'laboratory' conditions), the explanatory emphasis has fallen very heavily on the score, and musical structure, as the primary determinants of expression and meaning in performance. But as I have tried to indicate here, there is a great deal besides this that would repay serious attention.

Listening to Performance

Having considered some of the issues in psychological approaches to the production of performances, I now turn to what it is that listeners hear in performance. It is useful to frame the question within the broader context of perception more generally, and to start by recognising that the primary function of our perceptual systems is an adaptive one – making sense of, and acting effectively within, a complex environment. The significance of this very general ecological starting point is that it emphasises that the most pressing concern for a perceiving organism is to know what is going on, and what to do about it. While the primarily adaptive function of our perceptual systems does not necessarily mean that they cannot serve other less practical functions as well, I want to pursue the implications of an ecological approach as it relates to the perception of performance, since I think it offers a fruitful way to understand what it is that listeners hear when they listen to the complex auditory environment of a musical performance.

The most immediately striking characteristics that listeners notice when they hear music being played relate to the physical sources of that music – the instruments, bodies, and actions that make the sound, and the space within which it is taking place. In most circumstances, this is such a familiar experience that most of the time experienced listeners seem to pay little attention to it. When I hear a CD of a string quartet playing Haydn Op.76 no. 3, I am hardly aware of noticing that there are stringed instruments being played with particular bowing actions in a moder-

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ately large room – but when this 'transparency' is challenged, the importance of these basic attributes is thrown into relief. When at a live orchestral concert a piece makes use of a novel combination of instruments, it can be distinctly unsettling not to be able to work out what it is that is making the unusual sound; and in electroacoustic music, or other kinds of acousmatic music, the puzzle of what it is that sounds are the sounds of has always been a central preoccupation (see Windsor 2000). In the Western art music tradition, by contrast, under the influence of the ideology of 'absolute and autonomous music' that has dominated the tradition since the latter part of the eighteenth century (see Chua 1999), the focus has shifted emphatically away from concrete and tangible aspects of how sounds are produced to apparently more remote and abstract attributes: their structural functions, style features, emotional character and so on. These are the 'virtual realities' that constitute the sources of what listeners hear in a performance, and are in turn the reason why discussion of performance tends to concentrate on the relationship with structure and notation, emotional narratives, or historical sensibilities.

Central to these preoccupations is the distinction between work and performance, and here different views of the obligations and responsibilities of the performer are again critical – as noted at the start of this paper. If one view of performers is that they should aspire to an ideal of self-effacement in the service of the work, then a consequence should be the inaudibility of the performer, and a sense of the work itself made manifest in a pure and unadulterated manner. While they are not identical ideological positions, there is a strong connection here with the now largely abandoned 'authenticist' approach to historically informed performance, and its associated 'Urtext' approach to editorial fidelity. If performers are supposed to be transparent channels, then it is crucial that the source from which they are working, and the means of performance (instruments, performance practices, etc) should be as uncorrupted as possible. By contrast, if works are regarded as opportunities for performers to explore and express their creativity, then 'transparency', or the 'purity' of either the source or its means of realisation, are simply not an issue: the focus now is on what performers can do with and in the situation, how they can find interesting ways to bring music into being (see Hennion 2003 for further discussion of this more distributed approach to musical creation). Listening to performance is then (and obviously) primarily a case of listening to performers, with the 'works' that they are performing regarded

as a kind of temporary environment in which their own skills and creativities can thrive or founder (see also Cook 2003). Imagine hearing the Sibelius violin concerto as if it were improvised: what the soloist, for example, is doing now seems (and arguably also sounds) quite different from notionally the same event heard when he or she is understood as an 'interpreter'.

An attribute that changes significantly in the shift from 'performer as intermediary' to 'performer as creator' is our response to their bodily presence. Although we have become very familiar with listening to music presented acousmatically, most people still have a fascination with the concrete engagement and presence of human performers. It is this, as well as other aspects of performances as social and temporally bounded events, that keeps audiences going to live concerts at which the purely auditory circumstances are often much less favourable than can be obtained from a standard domestic audio system. Seeing, hearing and just 'being present at' the moment of music-making remains a fascinating and engaging experience (or it can be). But when performers are regarded as intermediaries between the composer (or the abstract work) and the audience, then there is an obligation for the performer's physical presence, and certainly physical effort in producing the music, to be inconspicuous, so that nothing impedes the direct transmission of the work. In improvised performance, by contrast, in which the creative role of the performer is not in question, the 'presence' of the performer is not just acceptable – it may even be an expectation or requirement. There are listeners who find the humming and groaning of Glenn Gould in his recorded performances damaging and intrusive, but my hunch is that people are much more tolerant of, or even enjoy, a similar level of spontaneous vocalising in the recordings of the jazz pianists Oscar Peterson or Keith Jarrett. And audiences who find the physical performance manner of extrovert musicians in an art music tradition distracting and irritating tend not to have the same response when they are in the presence of improvisers. As Davidson has shown empirically (e.g. Davidson 1994, 2001), a sense of the body, and of physical involvement or physical effort in making music, is a very important part of how people perceive performance.

With conventional acoustic instruments, the relationship between physical involvement, or physical effort, and musical production seems quite direct – though even here there is scope for perceivers to find performers more or less genuine (and therefore less or more irritating) in the ways in which they use their bodies

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in performance: an excess of apparent physical means over musical or simply sonic ends can be damagingly unconvincing. But the development of electric and electronic instruments has led to a situation in which the relationship between direct physical interaction with the instrument, and the sonic result, has become partially de-coupled, with interesting consequences both for listeners and for the choreography of performance. The electric guitar, with more than half a century of incredibly widespread use, is a striking case. The instrument still retains a very significant straightforwardly physical character, but electric amplification means that the relationship between the physical force exerted by a player and the resulting sound is radically transformed. The smallest, most discreet, movement by a player can have dramatic results with the consequence that a whole choreography of guitar playing has developed which seems to perform the function of helping to 'justify' or 'ground' the sounds that the audience hear. The extravagant arm and whole-body movements of lead guitarists, which are of course technically 'unnecessary', seem partially motivated by a desire to use the kinds of physical gestures that their dramatic sounds would usually specify. Thompson and Russo (2004; see also Thompson, Graham and Russo, 2005) have discussed the extraordinary range of facial expressions, as well as upper body movements, of the guitarist B. B. King in a video of a live performance that also seem to perform this expressive-motivating function. More extreme examples can be found in live performances of electronica: many of the bands involved (the British duo The Chemical Brothers is an example) make their music on studio equipment but also give live performances, at which the performers can be seen making extravagant physical gestures and movements associated with the programming and triggering of their digital equipment. The vestigial nature of the movements involved in pressing buttons and turning knobs, and the remote relationship between those movements and their electronic and eventually acoustical consequences, means that the movements lack both the scale and the shape to establish a perceptually convincing sense of causality. The motivation to superimpose functionally redundant movements is understandable, reflecting as it does a desire to connect physical action with musical production in a way that has a degree of ecological realism about it – but the result can often seem faintly ludicrous.

In summary, a productive way to think about the perception of performance is to consider the rather general question 'What is going on?' where this can refer to physical attributes of the

player, instrument and space; structural events such as phrases, gestures, harmonic progressions, rhythmic patterns and melodic trajectories; emotional states and narratives; and ideologies of performance. As this far from complete collection demonstrates, a lot of different things are 'going on' simultaneously in performance, of which only a comparatively small part has so far been investigated in any detail. A great deal still remains to be discovered both about what it is that listeners are aware of when they listen to performance, and how those attributes are specified in sound and vision.

Contemporary Performance, Notation and Communication

The final part of this paper considers some issues arising out of a recent collaborative project on performance (for a fuller account see Clarke, Cook, Harrison and Thomas 2005). The majority of empirical research on performance has been carried out under laboratory-style conditions, with the tonal/metric music of the common-practice period, and usually in the context of highly practised 'final state' performances. The aim of this project was to investigate performance under much more realistic conditions, using contemporary music and its associated performance practices, over a period of practice and rehearsal, and culminating in a public performance given in real concert circumstances and with a genuinely public audience present.

Background

In 2001, Philip Thomas – a Sheffield-based pianist specializing in contemporary music – planned a festival of music by Morton Feldman, to take place over a weekend in the following October (2002), in a local art gallery. As a part of the festival, Philip decided to commission three British composers, each influenced by the work of Feldman, to write a new solo piano work to be played alongside the Feldman works on each of the three nights of the festival. This provided an opportunity to study the interpretation of new music from composition to first performance, an important principle being that the whole process should be as 'natural' as possible – largely guaranteed by the fact that Philip had originally conceived the project as a public performance project, and that the success of the weekend festival at which the new works would be performed was his overriding consideration.

A variety of data was collected, in order to provide different

perspectives on the interpretative process. Philip agreed that for each commissioned work, he would keep an informal diary of reactions and thoughts as he studied each piece, and that from early on in the rehearsal process he would record both audio and MIDI data on the same Disklavier grand piano that would be used in the public performances. In addition to the MIDI and audio data, three types of interview/discussion data were recorded: 1) meetings (development sessions) between Philip and each of the three composers approximately mid-way through the learning process, at which Philip would play the piece in its current state, talk to the composer about any ideas or problems, and ask the composer for his reaction to the approach so far; 2) a recorded interview between myself and each of the three composers at some point shortly after the first performance, to discuss the composer's thoughts about the performance, and any other observations about the piece and Philip's approach to it; and 3) a recorded interview between myself and Philip at some point in the week after the first performance, to record his observations and reflections on the performances and whole learning process. Recording these interviews after the first performances helped to ensure that the process of learning and performing the music did not become too self-conscious for Philip, and also meant that the composers could approach the experience of the first performances in a normal manner.

In summary, the following data were collected:

1. MIDI data from rehearsals and the first performance.

2. Audio data from rehearsals and the first performance.

3. Informal diary data kept by Philip through the learning phase.

4. Audio recordings of a meeting, play-through and discussion between Philip and each of the composers at an intermediate point in the learning process.

5. Audio recordings of an interview with each of the composers, and separately with the performer, arranged soon after the first performance.

In this paper, I will do no more than pick up on a couple of aspects of one of the three works involved in the project, a twenty-minute composition by Bryn Harrison entitled *être-temps*.

The Piece

être-temps consists of 16 pages of score, each page of which (occasionally a pair of pages) functions essentially as a self-contained unit, separated from the next page by an unmeasured pause. Example 1 shows the fifth page of the score as an illustration. As this and every page of the score shows, Harrison uses conventional staff notation, but does so within a rather less conventional metrical grid. Looking down the page, all vertically aligned bars have the same time signature, a metrical grid that Harrison established before writing in any pitches or rhythms. This framework functions both as a kind of 'container' for the material, but also as a component in a game that the composer plays with himself and his notation, the grid acting both to provoke and resist his compositional choices. The 'game' is largely a rhythmic one (the pitch structure of *être-temps* is, to use Harrison's own word, deliberately 'banal') and leads to some quite daunting-looking rhythmic

Example 1. Page 5 of the score of Bryn Harrison's *être-temps*.

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notations – as even example 1, which is one of the rhythmically less complex pages of the score, shows.

The composer explicitly recognises that this game that carries over to the performer, since some of the consequences of the notation for performance and the 'realisation' of the piece are things that he (Harrison) can't, and doesn't want to, anticipate. Making reference to the American painter Jasper Johns he comments:

Jasper Johns said that "Sometimes I see it and then paint it. Other times I paint it and then see it". And I really like that quote, because I think in some ways the way that I'm dealing with rhythm and the setup on the page, it's not purely deterministic in my point of view, even though you know, it's carefully regulated on the page but in some ways I'm writing it to hear it, as much as I'm hearing it to write it.

And later:

I wouldn't want to feel that I was one of those composers who feel that there's no flexibility in terms of what the player can bring to a piece, I think that's where the sort of human aspect comes in and I think that that's the really, really important part of music-making as far as I'm concerned. (Clarke, Cook, Harrison and Thomas 2005: 44)

This approach to rhythm by the composer in turn leads to some interesting approaches on the part of the performer. As Philip Thomas puts it:

Much of the rhythmic complexity in *être-temps* derives from the rests that surround the sounding events. As I devise a strategy for counting, a certain energy is created in my mind which impacts upon the articulation of the gestures. Page 5, for example, consists very simply of the same three-note cluster repeated at different dynamics, with slightly different durations, and positioned irregularly throughout the page. The complexity of the counting needed to measure accurately the lengths of the intervening rests is, of course, unheard by the listener; but the impact of that counting upon the articulation of the cluster across time is such that each sound has its own energy. (Clarke, Cook, Harrison and Thomas 2005: 39–40)

And in relation to other parts of the score, where complex ratio indications in the rhythmic notation are more evident:

I tabulated a literal metronome mark for all the differing tempos, so that I could be sure of the correct relativities of tempo; this also enabled me to establish the degree of difference between relatively simple ratios, such as 8:7, and more complex ones, like a triplet within a 7:6 ratio. One

particularly complex relationship ... needed a calculator to reveal that the speed of a quaver in one bar (bar 136) corresponded to 114 MM, while in the next it was 121 – a difference of only 6%. ... I used this table of measurements only as a guide: it is more than likely that a 7:6 ratio on page 3 will be slightly different from the same indication on page 6 in any given performance. I treated these tempo inflections relative to their immediate context, thinking of them as nudges up or down in speed, whilst also referring to the table to keep me roughly in check. Thus my aim in all of this was to preserve the intended relative proportions, so that the shapes of the tempo changes would remain true. But in any case the tempo inflections make up only part of the story: they work in combination with other factors, such as complex rhythms and dynamics. The sometimes multi-levelled complexity of the notation resulted in an interpretation that reflected the interaction of these different factors. ... Many of the concerns of traditional analysis in relation to performance simply do not apply in music such as *être-temps*. The far more interesting approach is to study the relationship between notation and intention, and how performers take an active role in the creative act of forming the material. (Clarke, Cook, Harrison and Thomas 2005: 40–41)

Timing structure and dynamic precision

The music of page 5 (see example 1) offers a number of challenges and opportunities to the performer, and I focus here on just two specific attributes. First, every event on the page has one of seven specific dynamic markings (ppp, pp, p, mp, mf, f, ff) with only one occasion (bar 101 and its repeat) on which successive events have the same dynamic level. Given the discontinuous and atomistic character of the music on this page – a succession of isolated, but always identical, chords – this presents the performer with the challenge of attempting either to maintain seven distinct absolute dynamic values, or of trying to make more local relative values fall into line (i.e. making sure that an mp next to an f is sufficiently quiet, but not so quiet that it becomes too similar to a subsequent pp) – or perhaps of responding to the notation is some quite different way. In looking at Philip's performance data, it is useful to have a quantified equivalent of the dynamic markings shown in the score, and as a simple first approximation I have converted the seven dynamic levels (from ppp to ff) into seven equally spaced values, setting the lowest level (equivalent to ppp) at 0.16, which is close to his average value for the quietest notes in the page; and the highest level to 0.57, which is close to his average value for the loudest notes. The correlations between

these quantified score values and the performance values are all very high, in a narrow range between 0.93 and 0.95, for the seven recordings – with the exception of the first recorded rehearsal where the correlation is 0.77. Figure 2 shows the MIDI velocity values for the quantified score values compared with the data from the first rehearsal (upper panel) and the data from the performance (lower panel). The measured (as opposed to 'predicted') values shown are in each case the mean of the individual velocity values for the three notes in the chord. In the first rehearsal, the dynamic profile keeps to the general contour of the score indications, but there are clear departures from the notated pattern. In the performance, however, Philip adheres extremely closely to the pattern of relative values marked in the score – with two
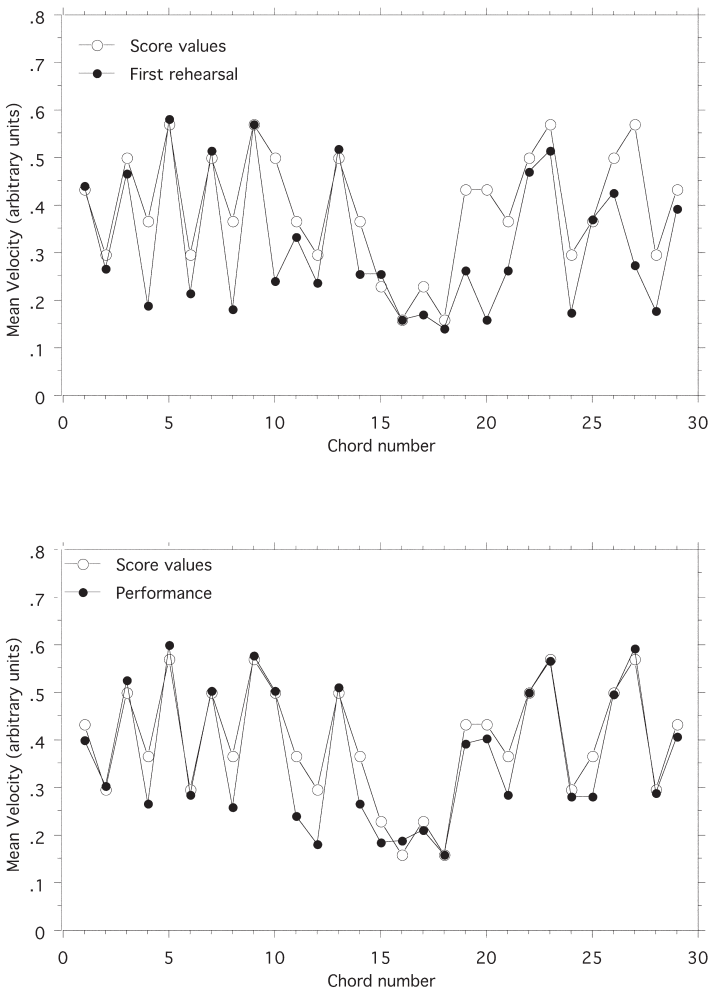

Figure 2. The mean velocity values, averaged over the three notes in each chord, for the chords on page 5. The upper panel shows data for the first recorded rehearsal, compared with a quantification of the score markings (see text for details); the lower panel shows the same comparison for the concert performance.

exceptions: the mp chords (chords 4, 8, 11, 21 and 25) are played with a velocity value that is more appropriate to, and often indistinguishable from, the chords marked p; and the distinction between pp and ppp (chords 15–18) is not preserved. In summary, from the second rehearsal through to the performance, Philip produces a remarkably faithful rendering of the dynamic levels marked in the score – and one that is arguably more literal than he himself is aware of aiming at. When asked – some time after the performance – about his own approach to the dynamics of this passage, he remarked:

I think my dynamics were relative within the page generally, though with an awareness always of the sound I was wanting in the piece as a whole. Thus I didn't want a harsh loudness even when ff and I knew I could really go down to a very quiet level in pp. So there is also a sense in which I would read similar meanings into all ffs and pp.

But he also added that 'For me the pattern is not important. I just respond to the notation'.

A second characteristic of the music on page 5 is its rhythmic discontinuity, with the three-note cluster appearing irregularly and unpredictably throughout the page. As with the dynamic markings, the question that I want to examine is the extent to which Philip realises this complex rhythmic notation in a 'faithful' manner, since his own comments in relation to the music on this page indicate that he takes the notation very seriously: 'The complexity of the counting needed to measure accurately the lengths of the intervening rests is, of course, unheard by the listener; but the impact of that counting upon the articulation of the cluster across time is such that each sound has its own energy.'

The relationship between Philip's data and the notation can again be assessed using correlation, and the result shows a very close correspondence between the idealised score values (based on a literal quantification of the notation at the marked tempo of quaver = 104) and the data from the recordings; all the correlation coefficients are in a very narrow range between 0.96 and 0.98, with no trend towards 'improvement' from the first rehearsal to the performance. Philip seems to have come to the first recorded rehearsal with a very stable conception of the music's rhythmic properties already established. Figure 3 shows the profile of inter-onset intervals for the first rehearsal (top panel), final rehearsal (middle panel) and performance (bottom panel), each compared with the idealised score values. The overall fidelity of all three is clearly apparent – though at the first rehearsal Philip appears
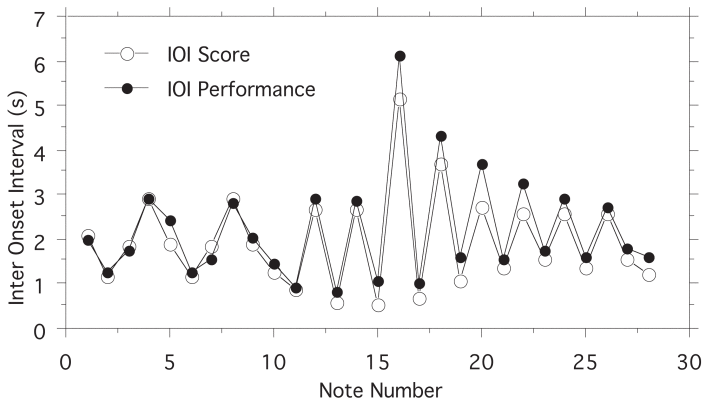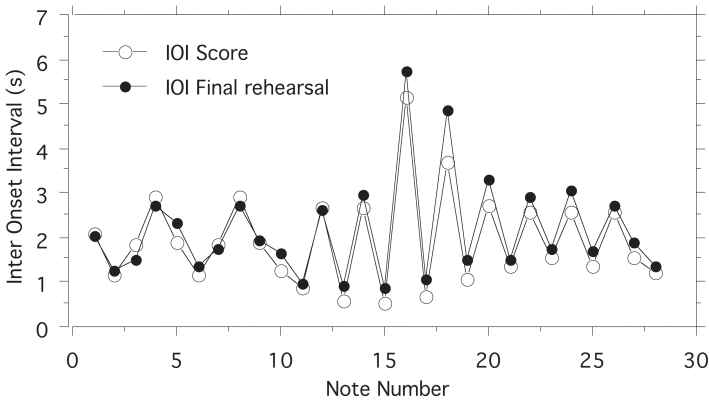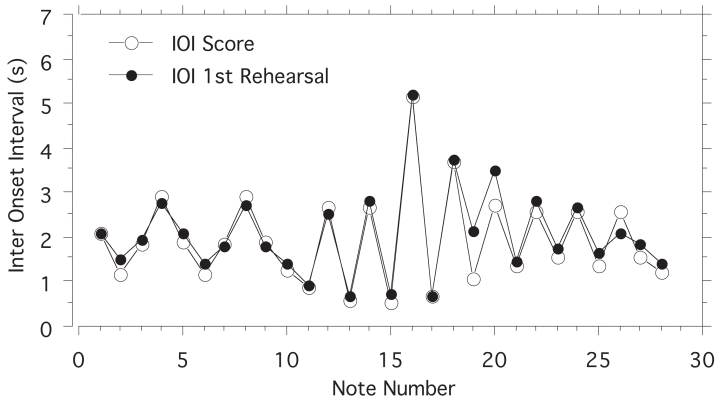
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Figure 3. Timing profiles for the chords on page 5 compared with their idealised score values. The top panel shows data for the first rehearsal; the middle panel, data for the final rehearsal; and the bottom panel, data for the concert performance.

to misjudge the timing of chord 19 (the immediately repeated chord at bar 101), a misjudgement that is eliminated at the next rehearsal and never appears again.

Having looked at this small sample of data, there is an appar-

ent paradox in Philip's concern on the one hand to tackle the notation with considerable fidelity and precision, using the metronome and calculator as his tools; and on the other hand his attitude to the notation as a 'prompt for action' rather than a recipe to be followed. If he doesn't regard the score as something that is supposed to be played literally, then what is the point of spending all that time and effort in working out ratios and timings in such detail? Notation like this is open to the suspicion of being at best a waste of time, and at worst a fraud. As Philip's earlier remarks have made clear, preparing music like this involves a huge amount of effort, and it is more than likely that listeners are quite unable to pick up and follow what the notation appears to prescribe. Given that, is it reasonable to expect the performer to use a calculator to work out what the notation means, as Philip says he did? Wouldn't it be more sensible and more honest to notate the music in some simpler and more transparent manner?

To suggest this kind of 'simplification' is to fall back into regarding notation as a transparent medium. The performer's role is not to reproduce either the score, or the sound that the score seems to specify, in performance. Rather, it's a question of taking the music apart each time you play it, interpreting it as much as possible from first principles each time, reacting to and working with whatever the notation on the page elicits. To put it the other way around, the score prompts the performance; it initiates a process of interaction between performer, page and instrument, with the page acting as a kind of surrogate for the composer. This is a process that comes to an end only as the sound dissipates - and that will happen each time the music is performed. It is significant that in some recent recording sessions at which Philip again played the piece two years after first performing it, and after a considerable break from it, he first played it (with the notation in front of him, as usual) from what he described as a kind of 'residual performance memory', and then – after a couple of weeks, during which he again took the piece apart and worked on it – with renewed freshness. He characterised the initial set of new recordings as lacking in life, and falling back on a sediment of previous habits and routines; whereas in the second session he again felt more directly engaged with the notation itself and more alive both to the obligations that it imposed (with the result, he felt, that the performance was more accurate) and the opportunities that it offered (with the result that the performance had more character and 'bite').

Philip's own attitude is to regard the notation is something to

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explore, within which as yet unknown discoveries can be made – but that those discoveries depend on engaging with the notation in detailed and serious terms. The 'resistant' character of the notation functions as a foil to the ever-present danger of falling back on easy habits and lazy complacency. In the same way, Bryn Harrison characterised the unpredictable sequence of dynamic markings on page 5 (see example 1) as a means for the keeping both the performer and the listeners alert:

I was trying to draw attention to the immediacy of each moment and to reinforce this sense of time as a perpetual present. The dynamics could have been ordered differently and still worked. I don't remember any specific use of patterning (in fact I seem to remember using chance operations to determine each dynamic). What was important was the relationship that each dynamic established with the next, keeping the chords alive, keeping the performer (and hopefully the listener) present. (Clarke, Cook, Harrison and Thomas 2005: 63)

This does not fit easily with the traditional musicological model in which the score acts as the transparent representation of a predefined musical work that is communicated, through performance, from the composer to the listener. It is evident that in music like *être-temps*, and perhaps much more generally, the performer has an essentially creative role in the process, acting as a kind of collaborator with the composer (and perhaps even, as suggested by Bryn's last remark, with the listener). This is equally hard to accommodate within the model normally adopted by psychological research into expressive performance, in which performers are assumed to act as a 'channel' through which structural, emotional and motional characteristics of the work, or their response to it, are conveyed to listeners. In *être-temps* there are attributes of the score, and of the performer's response to the score, that are important for the performer's understanding of the music, but which may play little or no role in listeners' experiences. In relation to the music on page 5, Philip commented on how different it is to play notionally the 'same' event with different notations – for instance as a downbeat or as an offbeat – but it is not obvious, and perhaps not even relevant, whether or not this distinction carries across to listeners. As Philip says, he is 'counting like mad' during music like this, but doesn't expect listeners to hear that counting, or even the immediate consequences of that counting, in any direct fashion ('The complexity of the counting needed to measure accurately the lengths of the intervening rests is, of course, unheard by the listener; but the impact of that counting

upon the articulation of the cluster across time is such that each sound has its own energy'). This raises the prospect, therefore, of quite radical differences between performers' and listeners' experiences of the same music – regarded not as a failure of communication, but as a positive attribute of the music. As one of the other composers involved in this project (Michael Parsons) observed: 'I was reading that collection of Feldman's essays and he says … talking about … the relationship between the notation and what the performer does with it, … he talks about "notational images that do not make an impact on the ear as we listen"'. This is music that affords quite markedly different experiences for people with different kinds of access to it.

The same might be said of almost any music and perhaps of most social experiences: people often do things together but experience them differently. Consider how a party is experienced by the host, a friend of the host who meets his/her future partner, and a jealous rival. We do not think of this as presenting a failure of communication, because communication is just one of many forms of social interaction involved in such an event. To make sense of a musical event like a performance of *être-temps*, it may be beneficial to adopt a broader paradigm than has been normal in either musicological or psychological studies of performance, seeing the communication of structural or expressive information as merely one dimension of a complex social interaction. Whatever else it may be, music is always human action, and an approach to common-practice music similar to that described here for a contemporary piece may show that hidden and perhaps limiting aesthetic assumptions are built into established approaches to the study of performance.

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